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THE RUBBER AGE

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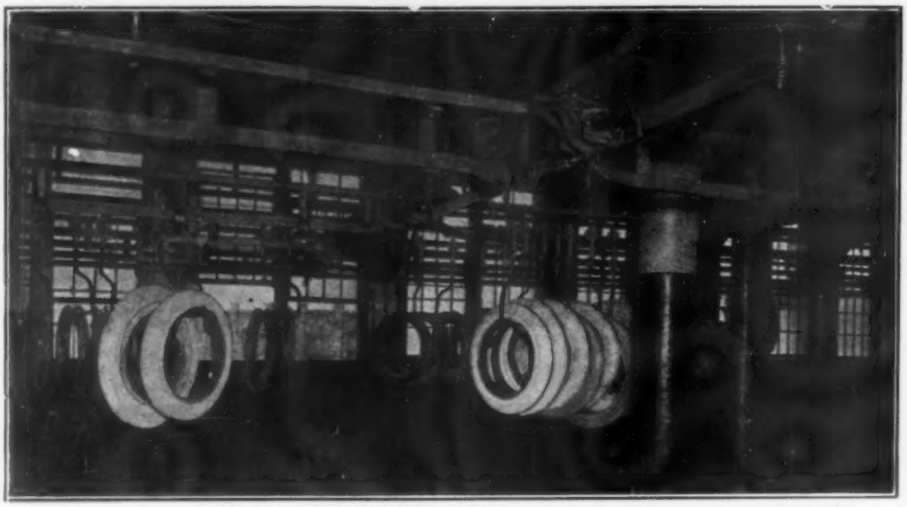

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THE
RUBBER AGE

VOL. XI SEPTEMBER 25, 1922 No. 12

Scientific Management for Rubber Manufacturers

Material Purchase, Inspection, and Storage

This Sixth Article of the Series, Which Began in the June 10th Issue, Covers the Buying, Checking, and Storing of Supplies for All Departments

By Alfred Baruch

Consulting Industrial Engineer, New York

WHEN the shop is small one of the owners usually does the purchasing. When the shop gets so large, however, that the man who supervises the production no longer can keep in touch with the markets, it becomes necessary to delegate the work of purchasing to someone else. So much was made clear before.

Upon the selection of the proper man for purchasing agent depends, quite often, the fate of the enterprise. That is, the purchasing agent has the power of good or evil to such an extent that his job becomes one of the three or four most important in the whole organization. If he buys economically material and supplies of the required quality, he enables the sales department to meet competition with a fair chance for success; if he buys poor material or expensive supplies, he places the business at the start under a handicap that is difficult to overcome. I know that the owner of a large organization, nationally known, has practically been driven bankrupt through the carelessness of his purchasing agent during the recent crisis. This does not mean that the man was in any sense dishonest, but that he failed to make the necessary investigations to acquaint him with sources of the cheapest material.

POINTS STRESSED BY THE AUTHOR

The purchasing agent often makes or mars a business enterprise.

He is essentially a trader—a merchandise buyer—and should be selected accordingly.

He must be solely responsible for all purchases, and there should be no restrictions, no divided responsibilities.

Correct detailed written records must be kept of all supplies purchased, received, stored, and used in manufacture.

Specifications for purchase requisition and purchase order are described.

Perpetual inventory, with minimum and maximum limits, is the best method yet devised for stock taking and keeping.

The reason here is the same one that furnishes the answer for similar conditions in many industrial plants: the purchasing agent had other duties besides that of purchasing and consequently could not devote his entire attention to the task of buying. He was a man who had done well in other capacities and it was assumed that he could take on some more work without any difficulty.

The purchasing agent is essentially a trader and should be selected for that quality above all others. If he is a shrewd man he will soon learn to know his market so well that he will be able to make the best bargains possible. There is a tendency to select men for this position because of their knowledge of the manufacturing process or else because of their familiarity with the commercial routine. Neither of these two classes of men, to my mind, seems to fill the need. The first type is usually ignorant of market conditions and pays high prices although he knows the quality and uses of the material very well; the second has little to recommend him except that the owners think that he must do since the practical factory man will not.

The difficulty with this situation is that the purchasing agent is entrusted with the task of selecting the quality and grade of material as well as with the purchasing of it at the lowest price consistent with safety. If the requisitions were to go through the hands of some person or persons who are qualified to specify in detail the kind of material or supplies wanted, this problem would be eliminated. Then a purchasing agent can be selected who knows the markets and who devotes his entire attention to buying the required material under the most economical conditions possible. This man would be solely responsible for the purchasing. It is much easier to find one trustworthy man than a half dozen. It is also much easier to watch the activities of one man than of a half dozen and the purchasing department needs careful watching under any circumstances. It offers more opportunity for heavy losses, through bad judgment, graft, nepotism, and general waste than any other function in the industrial scheme.

I do not wish to imply that all purchasing agents are dishonest or that even any great proportion of them are. But it is natural to look for trouble where it is most likely to occur. It is so easy to favor a friend or to return favors received in the past by placing an order with the salesman's house. Sometimes the owners themselves aid this procedure by being

interested financially in a supply house. It is only natural for the purchasing agent to wish to stay in the good graces of his superior by buying from the supply house in which the latter has an interest even if this means that the agent's company has to pay a relatively higher price.

The purchasing agent must be solely responsible for all purchases. He must be free from restriction of any sort and must be able to buy what is wanted at the lowest price. In order to do this successfully he must have certain information which he can use in his purchasing, and I shall devote a few paragraphs to a discussion of this matter.

The first essential for a purchasing agent is that he know and understand his needs very thoroughly. In addition to direct production materials he has to buy indirect materials and supplies. The direct materials are the rubbers, fabrics, compounds, and wire, all of which are used in the actual construction of the tire. The indirect materials are used in production but do not really appear as part of the finished product. They must be classified and purchased on the same economical basis that governs buying in the case of direct materials. The same holds for the supplies. It is a waste of money

PURCHASE REQUISITION

Date _____ Requisition No _____

Date Wanted _____ Purpose _____

Please buy the following for _____ Dept.
Charge Order No. _____

QUANTITY	DESCRIPTION

Approved. Ordered by

Planning Dept. Foreman

PURCHASE REQUISITION PRINTED ON 8½ x 5½ BOND PAPER

to buy enough materials or supplies to last for six months or a year when a month's supply is ample. And yet the temptation to do this is great when the quantity consumed is small.

The Purchase Requisition

In purchasing supplies and indirect materia's of small bulk it is absolutely necessary to keep records of previous experience. A complete list of the various products bought and the firms that sell them will serve as the greatest direct aid to the purchasing department whenever it is called upon to produce any material in a hurry. This knowledge may be acquired quickly if the other information essential to intelligent purchasing is available. The purchasing agent must know what is wanted and when it is necessary to have the required material or supplies. This information must be furnished by the planning department along with a statement of the specifications. In this respect the rubber factory is rather fortunate in that it uses only few basic materials and these, under ordinary circumstances, can be obtained readily or not at all.

But the rubber industry also uses a great variety of supplies and perishable equipment which must be purchased in small lots. I refer to liners, shells, trucks, benzine, etc. These supplies and pieces of equipment can stop production just as effectively as a lack of rubber or fabric. Therefore it is necessary for the planning department to provide the purchasing agent with requisitions in plenty of time to enable him to buy what is wanted without delaying production.

Furthermore the purchase requisition must take into account the amount of scrap, spoilage, or other loss that is incidental to production as shown by experience records. The situation must never be permitted to arise where the purchasing agent is compelled to pay extra money for speedy delivery. Out of six months' observation in one of the biggest rubber plants in the world not a single week went by that some material or supply did not have to be bought under pressure, for which extra money had to be paid. This does not necessarily mean that the dealer from whom the purchase was made always boosted the price simply because he knew that the manufacturer could not do without it. It may be that the purchasing agent, pressed for time, bought from some local dealer instead of from the one with whom he had already established trade relations and from whom he could have obtained better terms. Or else it may be that in order to get what he needed, the agent was compelled to make long distance telephone calls and send telegrams. Again, he may have been forced to have the purchase delivered by express when ordinarily freight transportation would have done. In some cases the purchasing agent even has to send a man to stay with the shipment or actually have it delivered by truck half way across the country.

These are the costly expenditures that come from improper planning and from failure to put the requisitions through sufficiently in advance of actual needs to avoid delay. Nor is it profitable to have to buy in large quantities far in advance of actual needs simply to insure against delay. This means investment of a lot of money in stores that is accompanied by a loss of the interest on the money thus used and by the danger of heavy losses if the price of material drops.

In any case lack of preparation in purchasing material is a source of waste and it is all the more inexcusable because a little planning in advance will eliminate the possibility of most of it. This work naturally falls to the planning department. It should write out the requisitions stating what is wanted, when it is wanted, and the form in which it is to be delivered.

The initiation of the purchase takes place in the department that needs the material or supplies. It may be a production department or it may be the stores department. The foreman of the department writes out a requisition in which he states what he wants. This is not an order to buy but merely a request. As it does not leave the plant there is no necessity for it to contain the firm name. The heading would show the name "Purchase Requisition" and the date, requisition number, department ordering, purpose, charge number, and the date the delivery is wanted. The body simply shows the quantity and a detailed description of the material or supplies ordered. At the bottom comes the signature of the department foreman and the approval of the requisition by the planning department.

The Purchase Order

From the foreman the requisition goes to the planning department which passes on its necessity. If the planning department decides that the need is genuine, it goes over the

DAVIS TIRE & RUBBER CO.
PROVIDENCE, RI

NAME _____ Purchase Order No _____

ADDRESS _____ Requisition No _____

Please ship materials listed below: Date _____

Shipping Date	QUANTITY	DESCRIPTION	Your Quotation

OUR PURCHASE ORDER NUMBER MUST APPEAR ON ALL CORRESPONDENCE AND INVOICES.

Davis Tire & Rubber Co.
per _____
Purchasing Agent

PURCASE ORDER PRINTED ON 8½ x 11 BOND PAPER AND PUNCHED TO FIT IN BINDER

order carefully to see that the description is so clear that there can be no possible misunderstanding on the part of the purchasing department. Then the purchasing agent selects the firm from which to buy through his catalog file or from his records. After deciding upon the source the purchasing agent writes out a requisition which is drawn up along the lines of the illustration accompanying this article. This order must contain the name of the vendor, his address, the date of the order, the purchase order number, the requisition number, the date on which the material is to be shipped, a description of the material together with the quantity and quotation price,

and the name of the purchasing agent. Provision must be made so that the purchase order number appears on all invoices. This precaution is taken so that no error may arise in connection with any shipment and that the order may be properly charged.

The purchase order should be made out in quadruplicate, one copy to go to the vendor, one to the planning department, one to the receiving department, and one to stay in the purchasing department's office as a record of the order. This copy should be filed according to purchase order number. A cross reference file of the requisitions filed by requisition number will serve to establish a continuous chain between the department ordering the material and the vendor. Any requests for progress reports sent in by the planning department can be identified by the requisition number. An added precaution against any of the orders being lost or misfiled can be taken by filing the purchase orders alphabetically and then making an index file of the order numbers. This method has the advantage of keeping the orders issued to one vendor together, but the more files there are the greater the chance for errors.

Best Method for Checking Deliveries

The planning department, of course, uses the order for following up the requisitions. The receiving department uses the order for checking the delivery of material. The question of the best method for checking deliveries has given rise to a great deal of discussion. Some authorities contend that it is necessary to furnish the receiving department with a duplicate copy of the purchase order to provide against any mistakes in delivery that might otherwise pass unnoticed. Others claim that this method is conducive to laziness on the part of the receiving clerk and that he is likely to omit a full count of the material received unless he is compelled to check everything and report the receipts on a blank sheet. This last is true. If the receiving clerk is not given a copy of the order and is compelled to report what has come in on a blank sheet, he is likely to count the deliveries. But if he is inclined to be careless, he can accept the invoice without a thorough check just as easily as he can take it for granted that the delivery is correct if the order and the invoice check. In other words, it is a toss-up between one method and the other if the receiving clerk is not trustworthy. But if he is, there is no question that having a copy of the order facilitates matters for him and makes an accurate check much easier. Then it has the additional advantage of calling immediate attention to the fact that all the material ordered was not delivered as per promise, if such is the case.

After having inspected the delivery to see that it checks with the purchase order, the receiving clerk must note it on the receiving record and forward the invoice to the purchasing department. The receiving record is invaluable in that it offers definite proof as to the time of all deliveries and it serves to protect the receiving department against charges of carelessness or even dishonesty. It may be a loose-leaf book containing ruled ledger sheets that are properly needed

Value of Inspection

The next step is for the planning department to inspect the delivery and see that it comes up to the order in every way. This inspection is particularly important since it determines whether the shipment is to be accepted or not. After the material is stored away the receipt of the shipment is acknowledged so that the inspection really puts the responsibility for the condition of the material on the receiver or else it returns it to the vendor.

From the receiving department the material goes to the storeroom where it is recorded and put away in its proper place. In order that this may be done successfully, it is necessary to classify the stores and to arrange the storeroom according to this classification. A distinction is made here between stores and stock. Stores are all materials and supplies that have not yet entered into production. Stock is the direct production material in the process of manufacture and after completion. Thus, crude rubber is a part of the stores, while inner tubes are a part of the stock.

Classification of Stores

The classification of the stock is automatic since it depends entirely on the product. It is natural to put solid tires with other solid tires and the pneumatics with their own kind. But the classification of the stores presents a different problem. Here the arrangement must be carefully planned with the view of getting the maximum possible use out of the space available. The first natural division of the stores is into classified and unclassified groups. The unclassified group consists of the miscellaneous supplies which are used irregularly and in such small quantities that it is impossible to assign them to a regular division. These stores are simply listed arbitrarily and given an identification number that permits the storekeepers to find them easily.

The classified group consists of the direct materials, the special materials, and the supplies. The direct materials are those that appear in some form or another in the finished product. The special materials are those which are used in production but do not appear in the product finally. Rubber is a good illustration of the first and soapstone is representative of the second type. The main divisions of the classified stores then would be Material and Supplies. The material would be sub-divided into Direct Materials and Special Materials. Each of these divisions are identified by symbols or numbers or even both. The method of establishing this identification was described in the article on standardization.

Form of the Stock Records

The next step after a system of classification has been established is to determine the form of the stock records. This form naturally depends on the type of stock records carried. These may be of several kinds and it is possible that in a large factory all methods may be used. As a general rule the small man will use the simplest method. This would be the rack card. By this method a card is attached to every bin and the quantity of material withdrawn from the bin is re-

PERPETUAL MATERIAL INVENTORY

DESCRIPTION_____

UNIT _____ SIZE _____ LOCATION _____

MINIMUM LIMIT: _____ MAXIMUM LIMIT: _____

ORDERED				RECEIVED			ISSUED			ON HAND			ON HAND		
DATE	JOB NO.	QUANTITY	TOTAL	DATE	JOB NO.	TOTAL	DATE	JOB NO.	TOTAL	QUANTITY	CURRENT PRICE	AMOUNT	QUANTITY	CURRENT PRICE	AMOUNT

Stock Record Form for Store-Room or Finished Stock. Printed on 8½ x 11 Card or Sheet that Can be Kept in Loose-Leaf Binder

corded on the card. This card contains columns showing the material added to or withdrawn from stock. Whenever it is necessary to know what material is on hand the stockkeeper must total the sums shown on the rack cards. If the material consumption is wanted, it is necessary to subtract from the amount of the present inventory the purchases during the time elapsed since the last inventory. The storekeeper makes all the entries on the rack cards. In case the shop is so small that it does not even warrant the employment of a storekeeper, then the foreman of the department which uses the material must make the entries.

This method has several serious objections. It is almost impossible to keep such a record accurately enough to make it practical. If the foreman or any productive worker has to make the entry the chances are against his doing it properly most of the time. If there is a storekeeper to make the entries it means that he has to take a complete inventory every time he wants to know how much is on hand. This is no improvement over keeping no record at all and taking an inventory whenever it is necessary.

Perpetual Inventory Best

By far the best method is to maintain a perpetual inventory. This is a current record of the quantity of material on hand, the quantity received and the quantity issued. The receipts come from the invoices and issues come from the requisitions made by the various departments.

This method has several distinct advantages. It permits the intelligent purchase of raw material. A knowledge of what is on hand makes possible the planning of shop work with the greatest saving of time and money. It enables the planning department to determine the cost of the product without taking an actual physical inventory. With a perpetual record of what is on hand, it is possible to make an instantaneous statement of assets and liabilities in case it is necessary to raise money quickly. In case of a fire the insurance company is much more likely to credit claims that are supported by proper store records of long standing. It reduces waste and theft by charging each department with the material taken out.

Such records should be divided according to the general classification of store indicated above. Then they are subdivided according to kind. A separate card record is kept for each kind and size of material and these cards are filed according to this division. Each card must give a description of the material it represents, the size, the unit of measure, the location in the storeroom, and then complete information as to the orders, the receipts, the issues, and the quantity on hand.

Minimum and Maximum Stock Limits

Next to the actual inventory figures which the card shows, the most important items are the minimum and maximum stock limits. These are fixed by experience stretching over as long a period as possible. The minimum limit represents the smallest quantity of material of that particular kind that it is safe to carry. When the supply reaches this point it is time to reorder. The maximum limit represents the greatest quantity of material that the planning department has found it economical to carry at one time. The actual quantity on hand should vary between those two limits.

The importance of maintaining the established limits cannot be over-emphasized. These limits are determined by experience, and to ignore them for even a little while means taking an unnecessary and unbusinesslike risk. They insure proper and efficient production by always having the material on hand when it is needed. They prevent too much money from being tied up in material. They serve as a measure of production efficiency since any departure from normal consumption of material indicates an increase or decrease in production.

A moot question in the matter of perpetual inventories is whether or not to show the actual value of the material on the stock record card. In the case of stores this is almost imperative since it is impossible to evaluate them otherwise unless the current market price is used arbitrarily. But for work in process records this is hardly feasible. The accompanying illustration of a perpetual inventory card is designed for the stores records and therefore shows the value of the material. But the work in process records may vary in design and should be planned always to fit the necessities of the department for which the records are kept.

An illustration of the departmental stock records may be found in the following description of the recording and storing of batched stock: "The trucker delivers the truck of batched stock to the stockroom designated on the move order. Here the stockkeeper assigns the truck to a definite location which he indicates on all copies of the move order. Then he signs the move order on the line provided for that purpose. He returns the duplicate to the trucker and puts the original in the collection box from which it is taken to the departmental office by the messenger.

"The move order is then filed in the calender stock record file by the order clerk. This is a 3 x 5 box file with an index for every compounded stock. When it becomes necessary for the order clerk to send some stock to the calenders, he pulls from the file the card representing the oldest truck in storage of that special stock. As the card already shows the weight of the stock, it is necessary to indicate the quantity of material to be used off the truck only when the order calls for less than a truckload of stock. This copy of the move order is then sent to the transportation office where the task of getting that particular truck out of stock is assigned to a waiting trucker."

Thus we see a move order used for a stock record. The conditions in this department were such that it was absolutely necessary to use the truck as the unit on which to base the records. Consequently, the cards representing these trucks were made up in quadruplicate copies and one copy served as a stock record until it became necessary to order this truck out of stock. Then the record resumed its function of move order and the file was automatically cleared of the cards. The cards were filed chronologically and then by truck number so that taking the first card behind the index meant ordering the oldest truck out of stock.

Finished stock can be recorded in the same way that the stores are handled and the same form will do with certain variations in the wording so as to represent actual conditions more faithfully. The various problems that arise in stock handling as result of the peculiar nature of rubber will be treated fully in the succeeding article.

Standardize Rubber Overshoes, Says Buyer

The suggestion was made here by a retail shoe buyer that it might not be a bad thing for manufacturers of rubber overshoes to get together and standardize their sizes and, to as great an extent as possible, the styles of their products, writes the trade reporter of the New York *Times*. Until the shortage developed some time ago this buyer had purchased the great bulk of his rubbers from one well-known company, but the paucity of the goods forced him to get them wherever he could. In looking at the goods as they came through the receiving rooms into the department, he was struck by the variety of styles in the same general types of rubbers. This feature, and the variance in sizes as well, was more forcibly brought home by complaints of the clerks about getting customers fitted properly. Sizes that their judgment and experience with the former dominant line told them were right did not fit at all in many of the newer goods, and considerable time was lost in hunting around until a proper fit was obtained.

Java Imports of Automobile Tires

The latest figures available from Java, according to unofficial sources, show that 209,000 motor tires were imported during the first 11 months of last year, 67,000 coming from France. Japan was second with 64,000, and the United States third, with 31,000. Great Britain contributed only 5,000, and Australia 3,300.

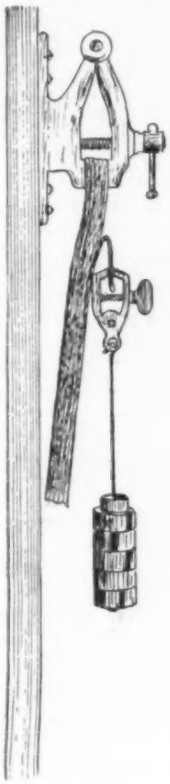
Analysis of Gutta-Percha and Balata and Testing of Balata Belting

GUTTA-PERCHA and balata both contain an amorphous colloidal hydrocarbon very similar chemically to the hydrocarbon of rubber. There is also a considerable proportion of resin present, amounting to about 50 per cent in the case of balata.

Methods of Analysis

The method of analysis is the same both for gutta-percha and balata, it being usual to estimate the moisture, resin, dirt and hydrocarbon.

Moisture.—Cut the material into fine shreds and weigh out about 5 grams. Spread them over a clock glass and dry in the vacuum oven at 95 deg. C. until the weight is constant. At least four hours are required for the complete drying, and, if possible, it is better to leave all night. The operation can be speeded up by drying at a higher temperature, but this must be done in an atmosphere free from oxygen, as at a high temperature the gutta begins to oxidize.



STICK TEST FOR BALATA BAR

Resins.—If fairly free from moisture, the original substance may be used for analysis, but if the moisture amounts to more than two or three per cent, the sample must be dried before starting the analysis.

First Method (Extraction).—Cut the balata into very fine shreds and extract with acetone in a Soxhlet. About 2 grams of the fine shreds are weighed out into a filter thimble, and extracted for at least ten hours. When complete the solvent is distilled off, and the extract dried in the oven at 110 deg. C. This method is by far the most accurate, but possesses the disadvantage of requiring a good deal of time to complete.

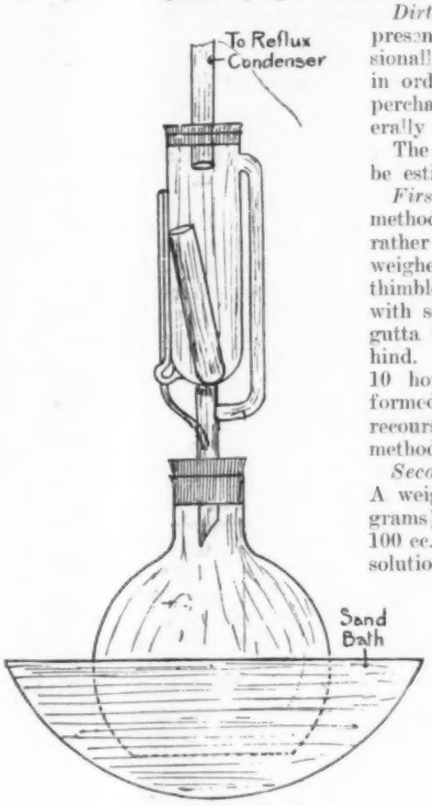
Second Method (Precipitation).—Weigh out 1 or 2 grams into a small beaker, and dissolve in about 10 or 12 cc. of solvent naphtha. Cover the beaker with a clock glass and warm on a water bath, with frequent stirring, until the whole is dissolved. Pour the solution very slowly into about 50 cc. of hot alcohol contained in a 500 cc. beaker. The stream of solution must be quite small and the alcohol must be well stirred during the operation. Rinse the small beaker with a little of the alcohol poured back, finishing with a final rinse of hot clean alcohol.

The gutta is precipitated, but the last traces only come out with difficulty, and it is advisable to digest the whole of the water bath for an hour or so. Decant off the clear liquid and well wash the gutta with hot alcohol. Dissolve the gutta in solvent naphtha and evaporate down to about 10 cc. Pour this solution into hot alcohol and precipitate the gutta as before. The dissolving and precipitating is carried out a third time.

The various alcohol, and solvent naphtha solutions and washes, are mixed together and the solvent boiled off. The total resins are now dried and weighed.

Separation of the Resins.—Dissolve the total resins in hot alcohol, filter to remove any traces of gutta, and cool the filtrate by means of a stream of cold water. After standing three or four hours in the cold, filter and wash with cold alcohol. The residue on the filter will consist of "albanes," and the filtrate will contain the "fluavilles," which are soluble in cold alcohol. Dissolve the residue on the filter with hot alcohol, evaporate off the solvent from the two solutions, dry and weigh.

Quick drying is essential in order to minimize oxidation.



SOXHLET EXTRACTION APPARATUS

Dirt.—The quantity of solid matter present is usually very low. Occasionally various fillers are introduced in order to give the balata or gutta-percha a definite color; these can generally be recognized at sight.

The quantity of solid matter can be estimated as follows:—

First Method (Extraction).—This method, like most extractions, is rather slow, but is very accurate. The weighed balata is introduced into a thimble in a Soxhlet and extracted with solvent naphtha or toluene. The gutta is removed, leaving the dirt behind. The time required is at least 10 hours. Occasionally the solution formed is too viscous for filtration and recourse must be had to the alternative method given below.

Second Method (Sedimentation).—A weighed quantity (about 1 or 2 grams) of the balata is dissolved in 100 cc. of hot solvent naphtha, and the solution allowed to stand on a water bath for two or three hours. The dirt sinks to the bottom and it is possible to syphon off the majority of the clear liquid without disturbing the sediment. Drain the sediment by means of the filter pump, washing with hot solvent. Dry at 110 C. and weigh. If any considerable quantity of fillers be present, these can be identified and estimated in the ordinary way.

Gutta.—This is usually estimated by difference, but if it be desired to determine the gutta directly the hydrocarbon is precipitated from a solvent naphtha solution by means of alcohol, all solid matter must be eliminated, and this is most conveniently accomplished by using the solvent naphtha solution obtained when estimating the dirt. Precipitate the gutta as described in the second method for estimating resins and repeat at least once. Wash the pellet of gutta and dry in an atmosphere free from oxygen.

Testing Balata Belting

Apart from the purely chemical analysis of the balata itself, it is desirable to test the mechanical strength of the finished belt. Strips one inch wide and ten inches long should be cut from the middle of the belt and broken on a tensile machine.

A more important test is known as the "stick test." This test consists of testing the adhesion between the plies and is carried out by determining the weight required to pull the plies apart under standard conditions.

Strips of belt one inch wide and ten inches long are cut

(Continued on page 432)

From *The India-Rubber Journal*, London.

ABSTRACTS

Technical — General — Commercial

Natural and Artificial Aging of Rubber

A well-known Italian rubber technologist, G. Bruni, has made an extended investigation of the conditions surrounding the natural and artificial aging of rubber and the effects produced by each method in the rubber itself. It was attempted to detect laevulinic aldehyde, which is one of the decomposition products formed when rubber ages naturally, in the products derived from rubber when the aging is induced artificially. At first the attempts were unsuccessful, due to the fact that the current of hot air, which was used in the experiment as the agent for bringing about artificial aging of the rubber, removed the laevulinic aldehyde as soon as it was formed. But, as soon as the experiment was carried out in a closed vessel, then there was no question about the formation of the aldehyde during the artificial process, as its detection was very easy. The conclusion was derived that artificial aging of rubber will yield the same products as natural aging. Although the aging was observed in closed vessels in an atmosphere of carbon dioxide, nevertheless this fact does not mitigate against the assumption that the aging of rubber is brought about by oxidation of the rubber, as carbon dioxide is decomposed into carbon monoxide and oxygen by the ultra-violet rays of light.

Rubberlike Masses

German Patent No. 351,104, assigned to the Wenjacit Gesellschaft m. b. H., is concerned with a process for the manufacture of rubber-like masses from phenol condensation products. When the mixture of phenol, soap and aldehyde, especially formaldehyde, is heated to such a point that the product can be drawn out into threads, a small amount of salicylic acid or benzoic acid is added. These chemicals cause a retradation in the speed of polymerization process The mass is then poured into forms and hardened in the usual manner. In carrying out this process about 100 parts of crude carbolic acid, 50 parts of soft soap and 100 parts of formalin are heated until a product of the proper consistency is obtained. Then from 2 to 3 per cent of salicylic or benzoic acid are added. The mixture is allowed to stand for about six months. It hardens slowly and forms a product which is elastic and possesses valuable properties, making it a good substitute for natural rubber.

Regeneration of Rubber

In German Patent No. 354,386 there is described a process for the regeneration of rubber. The old rubber is placed in a drum which has perforations all around its peripheral surface and which is fixed so as to rotate within a closed vessel. The solvent is placed in the latter and the drum in rotating brings the rubber within it in contact with the solvent. The process is carried out at a comparatively low temperature and at a pressure of about 2 atmospheres. After the solution is removed, the textile materials originally incorporated with rubber, are washed with the solvent and finally the excess solvent in them is thrown out by centrifuging.

Vulcanization of Rubber Tubes

In the *Gummi Zeitung*, volume 36, page 992, there is described an apparatus for the continuous vulcanization of rubber tubes in any length whatever. Tubes or hose over 35 meters in length can be obtained in this manner. The vulcanization of the appropriate tubular connections takes place in a small vessel, shaped in the form of a thick piece of piping, provided with a double flange on both sides.

Vulcanizing Rubber

The reaction products of an aldehyde comprising an open chain having a plurality of carbon atoms (2-7), and an amine, preferably a primary or a secondary amine having an electrolytic dissociation constant greater than 1 x 10-12 is employed as an accelerator in the vulcanization of rubber. A large number of such products is specified of which the condensation products of heptaldehyde and aniline, produced by heating equal molecular amounts of the two substances with 5 per cent of sulphur to a temperature of 140 degrees C until the water formed is evaporated, is typical. An example of proportions is 100 parts of rubber, 10 parts of zinc oxide, 3 parts of sulphur, and 0.5 part of the above described product, vulcanized under 40 pounds per square inch steam pressure for a period of 60 minutes. The quantity of accelerator may vary between 0.2 and 0.5 parts. Sulphur may be combined with the accelerator before mixing with the rubber, by heating equal weights of sulphur and accelerator at 140 degrees C for two hours or more, hydrogen sulphide being evolved. If desired the ingredients of the accelerator may be mixed separately with portions of the rubbing mixing, and these portions may then be mixed and vulcanized. By the use of these substances over and pre-vulcanization is avoided and a product of high tensile strength is obtained. British Patent No. 180,978.

Regeneration of Rubber

The old rubber is placed in a funnel-shaped device, which is perforated with numerous apertures. This is then placed within a closed vessel full of the solvent. The funnel is rotated and the rubber is heated with the solvent at a comparatively low temperature and under a pressure of two atmospheres. After the solution has been removed, the textile materials, which are mixed with the rubber, are washed with the solvent and then finally centrifuged. See French Patent No. 534,386.

The Odor of Rubber

The odor of rubber is always unpleasant to some people. In a recent issue of *Gummi Zeitung* there has been published a method of reducing the odor of rubber, which it is claimed gives excellent results. The rubber articles, immediately after vulcanization, are passed into a solution of caustic soda, containing 2 to 3 per cent of the alkali. The rubber articles are allowed to remain in this solution for a few minutes. In the case of colored rubber articles, the alkali treatment not only minimizes the odor of the rubber, but also increases the brightness of the color and softens the dark colored spots.

Dissolving Rubber

The rubber is first warmed and then squeezed through small openings in a piece of sheet iron plate. The rubber, emerging therefrom in the shape of fine threads is allowed to run into the solvent directly. The solution of the rubber in this form is very rapid. See French Patent No. 534,385.

A very good review of the theory and technology of the hot vulcanization of rubber is given in the German journal, *Chemiker Zeitung*, volume 46, page 441-3. All the various theories are discussed and the more important technical methods of vulcanizing rubber in the hot are described.

The Balata Industry of the Orinoco River Valley

The Recent Decline in the Balata Trade is Due Largely to the Competition of Hide Belting for Machinery at Reduced Prices

By U. S. Consul Henry D. Baker

Trinidad, British West Indies

THE balata business of the Orinoco River Valley first assumed importance about 25 years ago, its advantageous manufacturing uses having been recognized much later than those of India rubber and gutta percha. The balata tree, botanical name Mimusops balata, is found not only in Venezuela, but in the West Indies and British Guiana and other parts of northern South America, but the largest export is from Ciudad Bolivar, Venezuela. As this town was originally known as Angostura, and as the export of the balata gum has occurred in blocks weighing about 30 pounds each, the Venezuelan product has become known under the trade name of "Angostura block balata."

The export of balata is mainly to Europe, and especially to Glasgow, Scotland, which is the chief center for the manufacture of balata products. These include machinery belting, insulation for submarine cables, boot and shoe soles and other articles requiring strength, resiliency, and resistance to action of water and other elements. Balata gum is heavier than rubber, has a greater tensile strength, and does not slacken like rubber, but holds firmly when subjected to strain, moreover does not deteriorate or perish as rubber, and water has no adverse effect on its life.

In its manufacture into machinery belting, it can be used with canvas, being forced into the mesh and in sufficient quantity also to coat the outside, such composition it is understood, possessing greater strength than when balata alone is used.

BALATA RUBBER GATHERER'S HUT IN THE HEART OF THE VENEZUELAN FOREST

Volume of Exports, Present Depression

The total exports of balata from Ciudad Bolivar, were 1,778,517 pounds in 1921, valued at $867,487, showing a heavy falling off since 1920, when the exports were 3,115,094 pounds valued at $1,680,739. The exports to the United States were in 1921, in quantity 528,103 pounds and in value, $302,639, as against 371,749 pounds to the value of $212,598, exported during the previous year 1920.

The serious decline in the trade during the past year, and which still continues, has been mainly due to business depression in Europe, and over large stocks of balata held by manufacturers, and especially to more serious competition with hide belting in the machinery trade, as with such belting selling for only approximately one-third of former prices, it has become increasingly difficult to sell balata belting. The United States takes a comparatively small portion of the Venezuelan balata, this being apparently due to a greater preference in this couutry for the use of hide belting with machinery. It is understood that a considerable part of the Venezuelan balata sent to the United States, is purchased for the account of a branch factory in this country of Glasgow manufacturers, The Dick Balata Co., Ltd.

Industry Being Pushed Further into Interior

Owing to the gradual devastation of the forests with the steady chopping down of the balata trees, the gum gathering operations tend to become shifted further and further into the interior. The gum is no longer obtained in the immediate proximity of the lower Orinoco River, but from about 200 miles south and east of Ciudad Bolivar to the boundaries of Brazil and of British Guiana.

The chief clearing house or central station for balata production is at present at the small village of Tumeremo, about 200 miles south of San Felix, located near the head of the delta of the Orinoco, and about 300 miles, by a recently constructed cart road, to Ciudad Bolivar. The gum gathered in the country surrounding Tumeremo, or with average distances from Tumeremo of 150 to 200 miles, is brought to Tumeremo at an average cost of $8 per 100 pounds through Indian paths and contractors' trails, known as "picas," on mule backs. From Tumeremo, the product is taken by ox carts or on mule backs to San Felix, and from there by sailing sloop to Ciudad Bolivar, but with the completion of the road from Tumeremo to Ciudad Bolivar, the product is now largely shipped in oxcarts directly to the latter place, the cost being about $10 per 100 pounds. The road to Ciudad Bolivar is very rough and owing to absence of bridges over small streams, there is difficulty in making use of it during the wet season. To a small extent, motor cars are now used over this road, but only in dry weather, when rivers are not swollen.

Operation of Industry—Extent of Concessions

The balata industry is operated by merchants at Ciudad Bolivar making advances direct to contractors, or through customers in Tumeremo, supplying them with both money and merchandise in the way of provisions, etc., this to be repaid in balata. The arrivals of balata occur at Ciudad Bolivar during the spring months, but several months later there is another season of arrivals from June to September. When sold for the account of Bolivar merchants for export, it is usually consigned to business connections who handle it on a commission basis.

There are about 20 concessions for the working of balata in Venezuela covering about 10,000 square miles of territory, between 6 degrees to 8 degrees north latitude, lying south of the Orinoco, including the delta region, and the coastline of the grand mouth. These concessions are mostly owned by the Dick Balata Co., Ltd., of Glasgow, and run five years, of which two years have expired. At present about three-quarters of these concessions are being held under lease from this company by J. Acquatella, a leading commission merchant of Ciudad Bolivar, who, however, permits any contractor to work forests under his control at a nominal rental. The Dick Balata Co., Ltd., has practically retired from active operation of its concessions, and evidently at present prefers to buy in open market whatever stocks it requires.

Trees Bled after Being Cut Down

Under Venezuelan law, it is forbidden to cut down the trees, but this is difficult of enforcement, and is said to be practically disregarded. It is much easier to bleed a tree of sap after being cut down than while standing, morevover, it is claimed that once a tree is bled, it is useless for further production, being unlike in this respect the rubber tree, which can stand bleeding at regular intervals. When the trees are tapped, in accordance with the regulations, this is done once a year, the incisions being made vertically the whole length on one side of the tree, the other side being tapped the following year. When the tree, however, is felled, the bark is taken off, and the milky sap allowed to run out from the entire tree. There is then a production on the average, of one block of 30 pounds of balata per tree, whereas, if the sap is taken out only by incisions in the bark of the upright trees, only about one-third to one-half of a block is produced.

In felling the trees, about six trees per day can be cut down by one workman. The men are paid about $15 per 100 pounds for getting out the balata.

The Venzuelan Government secures a royalty of 4 cents per pound on the balata produced. Also there is a state tax of 5 cents per pound.

Angostura Block Vs. Demerara Sheet Balata

In the Venezuelan balata industry the sap obtained from the trees is boiled until the liquid contents are given off in vapor, after which the gummy mass is kneaded with the hands, and then thrown into holes which have been dug into the ground, of an oblong shape and strewn with plantain leaves, the balata in these holes then being stamped into shape with the feet. Sand, stones and pieces of wood often become carelessly introduced into the product, or with the deliberate view to adulterate and give greater weight to it. The merchants at Ciudad Bolivar, knowing that the blocks may contain material not as valuable as the gum, usually take the precaution to saw through the blocks to test the purity of the product offered.

In British Guiana the balata product is sun dried and kneaded out into sheets so thin that they can almost be looked through, which renders it impossible to conceal such adulterations as can occur with the Angostura block balata. The Angostura block balata is of a grayish black color, whereas the Demerara sheet balata is of a salmon red color. The latter balata, although apparently coming from the same kind of trees, usually has a commercial value of a quarter to one-third more than the Angostura block product, probably because of the greater visible assurance as to its purity. It is difficult to understand why the method of working the balata in sheets instead of in blocks should not be allowed in Venezuela as well as in British Guiana.

Increasing Scarcity of Trees

The balata trees take from 30 to 40 years to attain maturity, and many of the best producing trees are centenarians. Such long period required for growth prevents investment of capital in balata plantations, as has been done in the case of plantation rubber, which might yield returns within 10 years.

As the industry has to be worked farther and farther inland, and to bear increasingly high charges for transport, so also it is unfortunately true that the trees become scarcer, and where formerly 200 trees might be clustered together now hermit trees or not more than two or three at a time may be encountered 50 yards apart. The balata regions require constant exploration to locate new districts for operation, and after these are selected, huts for the workmen have to be erected in central locations.

In addition to the balata now obtained chiefly from southeastern Venezuela to the south of the Orinoco, there have recently been discoveries of a very fine quality of balata in the regions about the big upper bend of the Orinoco, and this new source of supply, where previously only rubber had been obtained, is now considered to offer the only hope for continuation of supplies, after exhaustion of the trees in the belt where now located.

It is anticipated that at the present rate of cutting down the trees the balata industry of Venezuela will approach extinction within the next five or ten years, except as new territory may be opened up in the districts of the upper Orinoco and about the water-sheds between the Orinoco and the Amazon.

Balata Tree Gives Useful Timber

The balata tree gives one of the best and most useful timbers to be found in tropical forests. Although a hard wood, it is not iron hard, and owing to its regularity of grain and freedom from knots, it is easily sawn, and still more so split; and workmen in general, prefer working it to many others of even less solidity. It is excellent in many respects, but mainly as house posts, and plates, joints or floor-beam and runners, as also for fence posts, spokes, shingles and railroad ties—the latter remarkably durable, as has been found in Trinidad, for instance, where the Government railway now uses them exclusively. The balata grows to very large sizes, some measuring five and six feet in diameter, while the unbranched shaft often rises from 50 to 60 feet.

It seems probable that upward of five million felled and bled balata trees are lying on the ground south of the lower Orinoco River. During the most favorable periods of the balata industry, as many as 15,000 trees per day have been felled, this being an average of about five trees per day for about 3000 men working in the industry, which started about 25 years ago.

Bleeding Spoils Value of Wood

The balata concessions have covered the balata gum alone, so that these felled trees would be readily available for any interest desiring to use them, for any purpose. It occurred to the writer that these fallen balata trees might offer an excellent opportunity to cheaply meet needs of American railways requiring cross ties, as it is well known that in Trinidad the Government railway uses balata wood almost entirely for such purposes, and finds they last from 10 to 12 years without renewal. Later, however, on making inquiry of the management of this railway, it was found that only unbled balata trees were used, and it was explained that once the trees are bled, the wood loses its durability, becomes brittle, and is easily subject to ravages of insects.

A fair amount of balata comes from the delta section of the Orinoco River and from the surrounding nearby coast, from whence it is sent on sloops and small boats to Port of Spain, Trinidad. Most of the so-called Trinidad balata really comes from this delta section. It is more fibrous, and not so compact as the product shipped from Ciudad Bolivar. The shipments of balata from Trinidad to the United States, as invoiced at the American Consulate in Port of Spain, were 118,760 pounds, valued at $45,669 in 1920, and 296,842 pounds valued at $58,827 in 1921. In addition to Angostura block balata, Demerara sheet balata, and Trinidad balata, it is understood that small exports of this product are also made from Colombia and from the Republic of Panama.

Analysis of Gutta-Percha and Balata and Testing of Balata Belting

(Continued from page 429)

and warmed at one end. While warm the plies are parted for about one inch at one end and the strips are left to cool until the following day.

The strip is now clamped vertically with the end of one ply standing free. A clamp is attached to this free end, and by means of hooks weights are gradually added until they are able to pull the first ply away from the remainder of the belt. It is necessary to maintain standard conditions in order to obtain comparative results, the two conditions to be kept being the temperature of the room and the rate of pull.

The temperature of the room should be kept at 60 degrees F., and the rate of pull must be one inch per minute. This rate is easily timed by noting the fall of weight per quarter minute; the weights are then rapidly adjusted until the rate is exactly one inch per minute. After one ply has been pulled off, the second and succeeding plies are treated in the same way. The mean of the weights required is known as the "stick."

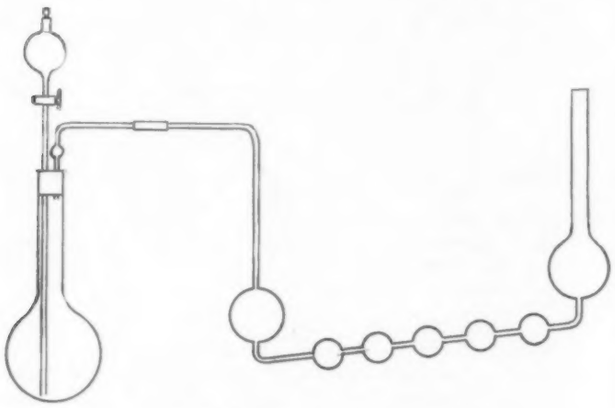
The Weighing of Rubber in the Tetrabromide State

By F. Utz, *Gummi Zeitung*, 1922

Translated for The Rubber Age by Ismar Ginsberg, B.S., Ch. E.

THIS article describes a new apparatus, which is very easy to make and which is used for the determination of the bromine in the rubber bromide by the Baubigny and Chavanne method.

In essential principle the apparatus consists of a flask and a bulbed tube. The flask has a capacity of 100 to 150 cubic centimeters. Its mouth is closed with a rubber stopper, piereed with two holes. Through one opening there is inserted a funnel tube for the introduction of the bromine. This tube extends down almost to the bottom of the flask. Through the other opening there is inserted a tube, which is bent at right angles and which extends just through the stopper only. This delivery tube is connected by means of a small piece of rubber with the absorption tube, which has five small and two large bulbs.



Reagents Used in the Analysis

1. *The oxidizing mixture.* About 40 cubic centimeters of concentrated sulphuric acid (density 1.84) are heated in an Erlenmeyer flask with one to one and a half grams of silver nitrate. The heating is continued until the silver is dissolved completely. Then, while the mixture is still hot, there are added from four to eight grams of powdered potassium bichromate. The heating is then continued again until all of the dichromate has dissolved. It is important to allow the reagent to ecol off thoroughly before using it, as otherwise there will be too violent an evolution of gas, which would result in the loss of some bromine.

2. *The absorption liquid.* This consists of a mixture of equal parts of a fifteen per cent of caustic soda lye with a cold saturated solution of sulphite of soda.

Method of Operation

The weighed rubber bromide is introduced into the flask. The flask is corked and the cold oxidizing mixture is poured into the funnel tube. The flask is placed in a paraffine bath and the absorption apparatus is connected therewith. The absorption apparatus should be arranged in such a manner that the top of the open tube at the extreme end of the apparatus is about 2 to 3 centimeters higher than the end of the apparatus which is connected to the delivery tube of the flask.

The stop-cock on the funnel tube is then opened carefully and the oxidizing mixture is allowed to flow down the tube and come in contact with the rubber bromide. When this precaution is taken the evolution of gas is not too rapid. If the reaction does become too violent, it is necessary to chill the flask; moreover, the paraffine bath itself has a partial cooling effect on the flask.

The entire mass of oxidizing liquid is passed into the flask taking care that at the end of the process the tube of the funnel feed is filled with liquid. When the evolution of gas moderates, the flask is heated gently by bringing the temperature of the paraffine bath up to 135 to 140 degrees C. This temperature is sufficient to drive off the bromine. The reaction is complete within about 45 minutes. The end of the reaction is told by the fact that bubbles of gas are no longer generated in the flask. The stop-cock is then opened and the glass stopper is taken out of the funnel. A water pump is then connected to the open end of the absorption tube and a weak current of air is drawn through the apparatus. When all traces of bromine have been driven out of the apparatus, the bulbed tube is detached and the contents of the bulbs are transferred into an Erlenmeyer flask, as well as the distilled water that is used to wash out the apparatus.

The liquid is then acidified strongly with nitric acid and the sulphurous acid is driven off by heating the Erlenmeyer on a water bath. An accurately determined quantity of fifth or tenth normal nitrate of silver solution is added and the solution is heated again. The precipitate of silver bromide is determined either by the quantitative method or by the titration of the excess of silver nitrate by means of a tenth or fifth normal solution of ammonium sulphocyanate. This method is very simple and gives excellent results.

Dealers' Rubber Contracts to Be Guaranteed

ALL crude rubber dealers in New York City in good standing will have their rubber contracts guaranteed in future, like the dealers of London and Singapore, according to an announcement by W. O. Perry & Co., special agents of the Fidelity & Casualty Co. and the Indemnity Co. of North America. Hereafter a dealer who has made a contract for future delivery of crude rubber direct from the plantations or through London or Amsterdam connections will not need to concern himself with the question as to whether the contract will be fulfilled by the other side. The insurance company will take care of that, the agents state.

This guarantee will apply to sellers as well as to buyers, just as it does in the case of dealers in England and the Malay States. There all the leading brokerage houses act as guarantors of the contracts either way. Several prominent insurance and indemnity companies have now agreed to issue bonds on both buying and selling contracts signed under the rules of the New York Rubber Trade Association. This assures a substantial market for rubber futures, and in this respect places rubber as a staple commodity in the same class with cotton, sugar, coffee, and other everyday necessities.

The form of guarantee is approximately this:

If "A" sells to "B" so much rubber to be delivered at a future date the bond provides that if the rubber is not delivered the insurance company will pay the difference in price between the cost of the rubber to "B" and the actual price that "B" would have to pay to buy spot at the time "A" should have delivered. If, however, "B" fails down on his end and is unable to take delivery of the rubber sold to him by "A", then the insurance company will reimburse "A" for the difference in price at the time delivery was due and the price which "A" sells to "B".

Puncture Closing Composition

A composition, which is to be introduced into pneumatic tires to close puncture, consists of crumb-like shreds of rubber in the spongy condition or a rubber substitute prepared from oxidized or vulcanized oils mixed with a thin paste of colloidal clay and water. See British Patent No. 180,807.

Government Statistics of the Rubber Industry

Official Census Figures for 1919 Show Capital of Nearly One Billion Dollars Invested, with More than 200,000 Persons Engaged

Prepared under the supervision of Eugene F. Hartley, Chief Statistician for Manufacturers

Bureau of the Census, U. S. Department of Commerce

THIS report presents statistics for establishments engaged primarily in the manufacture of rubber goods or products in which rubber is the principal material. The reports received were classified into three groups: (1) Establishments whose principal products were rubber belting and hose; (2) establishments making rubber boots and shoes; and (3) establishments engaged primarily in the manufacture of rubber tires, tubes, and other rubber goods.

Rubber products were also manufactured by establishments engaged primarily in the manufacture of other products to the value of $9,134,403 in 1919, and $752,503 in 1914.

Importance and Growth of the Industry

Table 1 summarizes the statistics for each census since 1879, with percentages of increase for each five-year period. With few exceptions, increases are noticeable at each succeeding census. The exceptionally large increases, however, from 1914 to 1919, in salaries and wages, cost of materials, and value of products, are due largely to a general rise of prices and wages following the World War, and do not, therefore, fairly measure the growth of the industry for that period. A truer index of the growth of the industry is found in the increase of the average number of wage earners, and the primary horsepower. The addition of the Federal income tax since 1914 will account for the increase in "Rent and taxes." "Contract work" or work performed by employees other than those in plants reporting, has little significance, since it represents merely the methods of manufacture used by establishments, which vary from year to year.

States Ranked by Value of Products

Ohio is preeminently the leading state in the manufacture of rubber goods. It has been in this position for the last several censuses. In 1919, this state reported 48.5 per cent of the total value of products and 40.2 per cent of the total number of wage earners. Massachusetts, second in importance, contributed only 13.3 per cent and 15.7 per cent, respectively, of these two items. Although 30 states reported rubber manufactures, the industry has become centralized in Ohio, Massachusetts, New Jersey, Connecticut, Michigan, Pennsylvania, Wisconsin, New York, Indiana, and Rhode Island, named in the order of their rank by value of products. Combined, these 10 states produced 96.6 per cent of the total value of products for the industry in 1919 and employed 96.2 per cent of the total average number of wage earners.

Wage Earners, by Months

The statistics for wage earners show the regularity or irregularity of employment, in accordance with the existing industrial conditions during the Census year reported. The number employed in the industry during 1919, month by month, ranged from a maximum of 173,824 in October, to a minimum of 144,931 in January, the minimum number being equivalent to 83.4 per cent of the maximum. Figures for the principal states are shown separately for belting and hose, boots and shoes, and tires, tubes, and other rubber goods, while for the United States the number of males and females is also shown separately for 1919.

Prevailing Hours of Labor

A marked shortening of the working day for the industry since 1914 is indicated by these statistics. In that year only 17.8 per cent were reported as employed fewer than 54 hours per week, as against 82.7 per cent in 1919. In 1914 the "60" and "Over 60" groups constituted 6.9 per cent of the total wage earners, as compared with 3.7 per cent in 1919.

Size of Establishments, by Average Number of Wage Earners

Analysis discloses the significant fact that 181 establishments, or 37.9 per cent of the total number, employed fewer than 21 wage earners each, while only 1,361, or nine-tenths of one per cent, of the total number of wage earners were employed therein. On the other hand the class "over 1,000" wage earners, comprising 35 establishments, employed 109,101 wage earners, or 68.8 per cent of the total average number, illustrating the extent of manufacturing operations in a few large establishments.

Size of Establishments, by Value of Products

At the census of 1909 and 1914, establishments with products valued at $100,000 to $1,000,000 constituted one group,

TABLE 1.—COMPARATIVE SUMMARY: 1919, 1914, 1909, 1904, 1899, 1889, AND 1879.

	1919	1914	1909	1904	1899	1889	1879	PER CENT OF INCREASE. 1914-1919	1909-1914	1904-1909	1899-1904	1889-1899	1879-1889
RUBBER GOODS—ALL BRANCHES.													
Number of establishments	477	342	267	265	301	167	104	39.5	28.1	0.8	—12.0	80.2	60.6
Persons engaged in the industry	206,202	88,821	56,059	47,676				132.2	58.4	17.6	....	....	....
Proprietors and firm members	98	87	103	105				....	—15.5	—1.9	....	....	....
Salaried employes	47,555	14,712	6,692	3,698	2,505	859		223.2	119.8	81.0	47.6	191.6	....
Wage earners (average number)	158,549	74,022	49,264	43,873	36,566	20,152	11,789	114.2	50.3	12.3	20.0	81.5	70.9
Primary horsepower	429,887	199,543	122,436	86,808	71,169	27,125		115.4	63.0	41.0	22.0	162.4	....
Capital	$960,070,726	$267,671,422	$162,144,564	$98,979,636	$78,463,771	$36,764,825	$8,974,187	258.7	65.1	63.8	26.1	113.4	309.7
Salaries and wages	278,991,545	60,445,980	32,977,676	24,623,078	18,575,728	9,526,909	4,051,431	361.6	83.3	33.9	32.6	95.0	135.1
Salaries	85,228,456	16,278,578	7,840,700	4,538,912	3149,155			423.6	107.6	72.7	44.1	....	....
Wages	193,763,089	44,167,402	25,136,976	20,084,166	15,426,573			338.7	75.7	25.2	30.2	....	....
Paid for contract work	3,676,318	408,851	25,099	76,188	62,861			799.8	1,529.0	—67.1	21.2	....	....
Rent and taxes (including internal revenue)	44,445,822	2,226,322	851,213	653,321	*653,321			1,896.4	161,5	....	....	....	....
Cost of materials	594,343,590	163,034,713	122,745,102	80,002,476	60,240,559	26,243,853	16,527,220	264.6	32.8	53.4	32.8	129.5	58.8
Value of products	1,138,216,019	300,993,796	197,394,638	148,015,391	99,880,693	42,853,817	25,309,648	278.2	52.5	33.4	48.2	133.1	69.3
Value added by manufacture	543,872,429	137,959,083	74,649,536	68,012,915	39,640,134	16,609,964	8,782,428	294.2	84.8	9.8	71.6	138.7	89.1

TABLE 2.—DETAILED STATISTICS OF QUANTITY AND VALUE: 1919 AND 1914.

PRODUCT	1919 Number and amount.	1914 Number and amount.
Total value	[1]$1,138,216,019	[1]$300,993,796
Tires:		
Pneumatic—		
Automobile—		
Casings—		
Number	32,835,509	8,021,371
Value	$603,896,200	$105,678,951
Inner tubes—		
Number	33,255,410	7,907,351
Value	$81,312,576	$20,101,084
Motorcycle and bicycle—		
Casings—		
Number	4,656,121	3,728,138
Value	$13,449,225	$6,905,853
Inner tubes—		
Number	1,125,097	
Value	$1,347,012	
Solid—		
Truck—		
Number	1,454,807	$13,735,681
Value	$43,917,152	
All other—		
Number	6,873,650	
Value	$9,004,543	
Boots, rubber:		
Pairs	9,207,703	4,024,486
Value	$26,066,647	$12,647,934
Shoes, rubber:		
Pairs	66,145,541	57,211,728
Value	$64,713,182	$37,858,222
Shoes, canvas, with rubber soles:		
Pairs	21,034,664	
Value	$25,176,684	
Heels, sold as such and on hand:		
Pairs	138,468,769	
Value	$16,103,501	
Soles, including composition or fiber:		
Pairs	9,777,085	
Value	$2,455,306	
Rubberized fabrics, sold as such or on hand:		
Automobile and carriage—		
Yards	40,750,500	
Value	$10,696,547	
All other—		
Yards	47,162,085	
Value	$13,712,376	
Belting, value	$22,436,242	$7,989,405
Hose, value	$26,998,292	$16,853,693
Packing, value	$7,316,819	$3,507,651
Clothing, value	$8,824,430	$6,799,515
Druggists' and stationers' supplies, value	$15,801,892	$7,511,755
Hard rubber goods, value	$34,383,231	
All other manufacturers of rubber, value	$80,719,898	$41,384,086
Reclaimed rubber, sold and on hand:		
Pounds	125,758,882	
Value	$20,173,040	$11,134,958
All other products, value	$9,711,224	$8,885,008

[1] In addition, products to the value of $9,134,403 in 1919, and $752,503 in 1914, were reported by establishments assigned to other classifications.

but at the census of 1919 this group was subdivided into groups of $100,000 to $500,000 and $500,000 to $1,000,000. Separate figures for the number of establishments and value of products have been compiled, however, from the returns for 1914. Table 7, therefore, gives combined figures for these two groups in the case of all items for 1909, and in the case of the average number of wage earners and the value added by manufacture for 1914. The statistics in the table show the degree of concentration of production in large establishments. In 1919 the group "$1,000,000 and over" included 137 establishments, or 28.7 per cent of the total number for the industry; employed 145,665 wage earners, or 91.9 per cent of the total average number; and reported products to the value of $1,070,086,951, or 94.0 per cent of the total value.

Character of Ownership

The predominance of the corporate form of ownership is shown. Corporations owned 85.3 per cent of the total number of establishments for the industry in 1919; employed 99.5 per cent of the total average number of wage earners; and reported 99.5 of the total value of products. During the five year period, 1914 to 1919, the average number of wage earners employed by corporations increased by 84,764, or 116.1 per cent; and the value of products by $835,019,019, or 280.3 per cent.

Number and Horsepower of Types of Prime Movers

From 1914 to 1919 there was an increase in the total horsepower for the industry of 230,344 horsepower or 115.4 per cent, due in a large measure to rented power which increased by 159,677 horsepower or 465.7 per cent. Owned power during the period increased by 70,667 horsepower or 42.7 per cent.

Fuel Consumed

One table shows the principal kinds of fuel used for the industry in 1919 and 1914. The principal fuel consumed in this industry is coal. In the consumption of anthracite coal New Jersey was the leading state, while in the consumption of bituminous coal Ohio ranked first, followed by New Jersey and Massachusetts. In the consumption of fuel oil Rhode Island was the leading state, followed by Ohio and New Jersey. Ohio was the only state that reported the consumption of any considerable quantity of gas.

Special Statistics

Certain additional detailed information concerning the quantity and value of products for the industry is collected by means of supplemental schedules and is summarized in the following tables.

The establishments in the industry were classified according to their product of chief value but in the manufacture of the various products there was much overlapping between the different branches of the industry. For example, there were only 15 establishments that reported the manufacture of belting and hose as a chief product, but 24 establishments classified as tires, tubes, and other rubber goods also reported some belting and hose.

Table 2 shows in comparative form for 1919 and 1914 the quantity and value of the products manufactured. As in 1914 tires were the chief product of the rubber industry, the output of this class being valued in 1919 at $752,926,708 or 66.1 per cent of the total value of products for the industry, as compared with $146,421,569, or 48.6 per cent, in 1914. The second most important branch of the industry, rubber boots and shoes, had an output in 1919 of $90,779,829, or 8 per cent of the total value of products for the industry, as compared with $50,506,156, or 16.8 per cent, in 1914. The value of belting and hose produced in 1919 totaled $49,434,534, or 4.3 per cent of the total value of products, as compared with a value of $24,843,098, or 8.2 per cent, in 1914.

The Use of Carbon Black in Rubber

PRIOR to 1914 carbon black was used by the rubber industry in small amounts for coloring, states the United States Bureau of Mines. Little distinction was made between carbon black and lampblack, the two compounds being used indiscriminately. At the present time, partly on account of the stimulus afforded by the rising price of zinc oxide, carbon black is used in large amounts as a filler for rubber, with a correspondingly decreased amount of zinc oxide. Many rubber men claim unusual properties for rubber so compounded. Carbon black is used in rubber in quantities of 3 per cent to 20 per cent by weight, and is said to increase the tensile strength greatly and to give increased toughness and resistance to abrasion. Some authorities believe that the life of the rubber and its capacity to carry loads are increased. Other rubber chemists are more conservative and do not admit that carbon black possesses any properties that make it irreplaceable.

Theoretically carbon black should be an ideal filler for rubber, owing to its extremely fine state of division and to the correspondingly large surface energy developed by mixing intimately with the gum rubber. It also serves to protect the rubber substance from the effects of light and it may retard oxidation. Whatever the exact facts may be as to the irreplaceability of carbon black in rubber, a large amount is now consumed by the rubber companies for automobile tires and other articles, probably 20,000,000 pounds annually besides 10,000,000 pounds exported in normal times.

Rubber May Prove to Be the Ideal Street Pavement

EXPERIMENTS which are being carried out on some of the main highways of Colombo, Ceylon, and London, England, with rubber paving blocks have proved so successful thus far that similar test pavements are being planned for the United States. At the recent annual meeting of Rubber Roadways, Ltd., a report presented to the stockholders stated that the section of roadway in Borough High street, Southwark, London, S. E., which was laid with rubber blocks vulcanized on expanded metal plates, continues to give generally satisfactory results after eighteen months of continuous use. A simpler and more economical method of attaching the rubber blocks to the plates has been evolved, and it is proposed to lay another experimental area with the improved process. The load was 190 tons per square yard per hour.

Albert Hargraves, experimental engineer of the Firestone Tire & Rubber Co., Akron, Ohio, recently said: "The British experiment with rubber paving sounds quite plausible, and I can see no reason why a similar experiment should not be tried here." Other rubber factory representatives expressed themselves as being receptive to the idea.

A considerable period of time must necessarily pass before it can be stated upon the best engineering authority that rubber street pavements and rubber sidewalks are superior to concrete or asphalt, but enough has been learned so far to justify manufacturers of rubber paving blocks in going further with their experiments. The life of a rubber paving block is now estimated at fifteen years, but as manufacturing processes are improved this estimate may be greatly exceeded. Durability, however, is not the only advantage; the absence of noise and the element of elasticity are two important factors to be taken into consideration.

Indoor rubber tile flooring has been known in this country for a number of years and its use in office and public buildings, elevators, hotels, steamships, etc., has given general satisfaction. But outdoor uses for heavy traffic is an altogether different proposition. Rubber Roadways, Ltd., is now watching the effect of rubber tiles one-half inch thick, in squares of eighteen to twenty-four inches, recently laid on two platforms at Euston Station, London, these tiles containing more than forty per cent pure plantation rubber. These platforms are used for main line departure and American boat train traffic, both exceptionally heavy. Other portions of the station are laid with this tiling which is specially backed to prevent the possibility of "creeping" or "spreading".

What is called a rubber paving block is not solid rubber but a structure made up of a base of wood or other solid material to which a layer or layers of rubber compound are vulcanized. "The quality of the block", said Mr. Hargraves when speaking on the subject, "depends on any one of the following factors: The kind of rubber compound used, the thickness of the layers of this compound, the material used as a base for the block, and, above all, the adhesion of the rubber to its base."

The public works department, Federated Malay States, has recently laid a rubber block paving at the porch of the Selangor Government offices, Kuala Lumpur. The blocks are concrete, expanded metal and slab rubber, size 8 15-16 inches by 3 15-16 inches by 3 inches deep. The slab rubber is vulcanized to the expanded metal thereby keying the rubber surface into the concrete block.

Rubber of the best quality was used: the optimur standard for time of vulcanization (not longer than ninety minutes and to have a bearing stress produced of at least 1,400 for a mixture of ninety rubber and ten sulphur) was adopted. Sulphur and minerals were commercially pure and special attention was paid to the size of the particles. The blocks were molded and vulcanized to dry lead molds, special molds being designed.

The expanded metal was embedded in the concrete block. The site selected may be criticized as not being on a line of heavy traffic and under cover, but it has been established that rubber road surfaces have an excellent surface wearing life and there is no tendency for animals or vehicles to slip on them when wet; and it is contended that the failure of most experimental sections to date is due to defective jointing of the rubber cap to the block. At the site selected every vehicle draws up with brakes applied and so the sheer strength will be well tested.

It will be observed on inspection that there is a slight unevenness in some of the block edges, due, it is suggested, to warping of the rubber caps, which defect could be eliminated by more care in vulcanization.

There is no doubt that the possibilities of rubber paving loom large in the future, and the outcome of the British tests in England and Ceylon will be studied with increasing interest by all rubber manufacturers and crude rubber planters and dealers seeking for new markets to absorb the production surplus in this industry.

American Paper Makers Testing Rubber Latex

THE 480 gallons of rubber latex, imported from England through the efforts of the rubber and paper divisions of the United States Department of Commerce, have, it is understood, been distributed to those American paper manufacturers who wished to experiment with the fluid. Other paper makers are requesting samples of latex for test purposes, and John Matthews, jr., chief of the paper division, is trying to learn whether any rubber importer is bringing in latex into this country or can be induced to do so.

The paper laboratory of the Bureau of Standards has received some of the latex and will begin independent experimental work on it very shortly. Specimens of writing, book and wrapping paper both with and without rubber latex will be manufactured to determine what effect, if any, the addition of the latex has upon the strength and folding qualities of the paper.

Frederick Kaye, inventor of the paper-making process in which latex is employed, may be prevailed upon to come to the United States and consult with the Bureau of Standards and the paper manufacturers and perhaps supervise the manufacture of paper according to his patents. In England some grades of paper have already been made containing rubber latex, and the results are said to be more than satisfactory.

The importance of increasing the uses of rubber latex through its wide employment in the manufacture of paper is hailed as one of the greatest boons to the rubber industry of recent years.

Chemical Establishments in U. S.

In a compilation made for the finance committee of the Senate by the Bureau of the Census, it is shown that there are 598 establishments in the United States engaged in the manufacture of chemicals. The capital employed is given as $484,488,412, salary and wage payments as $97,188,958, and the value of the products in 1919 as $438,658,869. The average number of wage earners employed during 1919 was 55,586. The establishments pay $28.338,749 in federal taxes and $3,592,640 in state taxes.

NEWS OF THE INDUSTRY

National Chemical Exposition a Big Success

Although the Attendance was Not up to Expectations, the Value of the Exhibits to the Rubber and Other Industries Was Conclusively Demonstrated

THE Eighth National Exposition of the Chemical Industries, held during the week of Sept. 11-16 at Grand Central Palace, New York City, is now history. Although the attendance has been larger in the past, the number and variety of exhibits occupying almost four entire floors of the big building and the daily exhibition of motion pictures, afternoon and evening, created intense interest and enthusiasm which atoned for any lack of visitors. From a strictly technical point of view the exposition was a decided success, because it offered to local and visiting chemists, manufacturers, and others identified with chemical processes opportunities to see, hear and discuss recent developments which meant much to them individually and to the future of the chemical industries.

Value of Exposition to the Rubber Industry

So far as the exposition's effect upon and value to the rubber industry were concerned, it enabled rubber manufacturers and others connected with the tire and rubber trade to learn of the latest chemical developments which have to do with improving the quality, efficiency and durability of various products of which rubber in combination with various chemicals forms an essential element. Rubber men were enabled to see on display practically all of the chemical ingredients and compounding materials used largely in tire, tube, and rubber sundries manufactures, and to make comparisons of qualities and prices.

In another column is given a complete list of these exhibitors at the show whose products are of especial interest to the rubber industry. Many of these exhibits were worthy of more than passing comment. They were exceedingly handsome and attractive and considerable money must have been lavished on the displays. Photographs of some of the booths have been reproduced to accompany this article, and it is a source of regret that THE RUBBER AGE has not space enough to devote to more of these illustrations.

Exhibits Not Described in Sept. 10 Issue

Complete descriptions of the various exhibits of interest to the members of the rubber industry were given in the Sept. 10 issue of this publication. Additional exhibits of interest to this trade, which were not mentioned in the previous issue were as follows:

CLAPP PRODUCTS CO., Boston and NEW YORK RUBBER CO., New York City. Showed Toron treated belts and tire fabrics and actual belts in operation; samples of Toron compound, manufactured tires, comparison of used belts, etc. T. G. Sullivan, of Clapp's technical department, was in charge.

CLEVELAND COOPERAGE CO., Cleveland, Ohio. Samples of Lastik lined barrel, used as a container for chemicals. This rubber-lined barrel is illustrated and described in another article in this issue. American Chemical Paint Co., Philadelphia, manufacturers.

L. O. KOVEN & BRO., Jersey City, N. J. Showed a line of tanks, pans, etc., as containers for various acids and chemicals. Also manufacture all kinds of vulcanizers. R. J. Menthe in charge of exhibit.

SMITH & SERRELL, Newark, N. J. Showed Pintite rigid couplings, Francke flexible couplings, and Keytite self-fitting keys. Mr. Smith stated that a number of rubber machinery manufacturers are greatly interested in the Keytite key and he expects a great future for it.

TALC & SOAPSTONE PRODUCERS ASSOCIATION, Washington, D. C. Interesting exhibits of various forms of talc and soapstone, in natural and refined states, for use in rubber manufacturing and other lines. Mr. Boardman, of the Eastern Talc Co., Boston, said that THE RUBBER AGE is the best trade journal he receives, and he reads many of them.

Interesting Papers and Motion Pictures

Two papers read and discussed at the meetings during the week, which were of particular interest to the rubber industry, were "The Photomicroscopy of Paint and Rubber Pigments," by Henry Green of the New Jersey Zinc Co., Palmerton, Pa.,

EXHIBITORS OF INTEREST TO THE RUBBER INDUSTRY

Abbe Engineering Co., *New York City*
Allis-Chambers Co., *Milwaukee, Wis.*
American Aniline Products Co., Inc., *New York City*
American Hard Rubber Co., *New York City*
Barber Asphalt Paving Co., *Philadelphia*
Benzine Condensation Co., *New York City*
Bristol Co., *Waterbury, Conn.*
Brown Instrument Co., *Philadelphia, Pa.*
Buffalo Foundry and Machine Co., *Buffalo, N. Y.*
Carrier Engineering Co., *Newark, N. J.*
Clapp Products Co., *Boston, Mass.*
Cleveland Cooperage Co., *Cleveland, Ohio*
Cooper-Hewitt Electric Co., *Hoboken, N. J.*
Day, J. H., Co., *Cincinnati, Ohio*
De Laval Separator Co., *New York City*
Devine, J. P., Co., *Buffalo, N. Y.*
Diamond State Fibre Co., *Bridgeport, Conn.*
Eimer and Amend, *New York City*
Foxboro Co., Inc., *Foxboro, Mass.*
Freeport Sulphur Co., *New York City*
General Electric Co., *Schenectady, N. Y.*
General Bakelite Co., *New York City*
Hayden Chemical Co., of America, *Garfield, N. J.*
Hunter Dry Kiln Co., *Indianapolis, Ind.*
Industrial Chemical Co., *New York City*
A. Klipstein & Co., *New York City*
Kewaunee Mnfg. Co., *Kewaunee, Wis.*
L. O. Koven & Bro., *Jersey City, N. J.*
Lunkenheimer Co., *Cincinnati, O.*
Luzerne Rubber Co., *Trenton, N. J.*
Mallinckrodt Chemical Works, *St. Louis, Mo.*
N. J. Zinc Co., *New York City*
N. Y. Rubber Co., *New York, City*
Pfaudler Co., *Rochester, N. Y.*
Roessler and Hasslacher Chem. Co., *New York City*
Sarco Co., Inc., *New York City*
Schaeffer and Budenberg Mnfg. Co., *Brooklyn*
G. Siegle Corp. of America, *Rosebank, S. I.*
Smith & Serrell, *Newark, N. J.*
B. F. Sturtevant Co., *Hyde Park, Mass.*
Talc & Soapstone Producers Ass'n., *Washington, D. C.*
Tagliabue, C. J., Mnfg. Co., *Brooklyn, N. Y.*
Whitall Tatum Co., *New York City*

and "What Has Been Accomplished in the Standardization of Scientific Apparatus," by J. M. Roberts, secretary of the Apparatus Manufacturers' Association of the U. S.

On the extensive motion picture program two subjects which appealed to the rubber chemists and manufacturers in attendance were "The Story of Sulphur," in two reels, made by the Texas Sulphur Co. in collaboration with the U. S. Bureau of Mines; and "The Romance of Cotton," one reel, illustrated with talk by David Wesson of Southern Cotton Oil Co. Another film of interest to rubber men because of its connection with carbon black, extensively used in the making of tire treads, was "The Story of Natural Gas," in four reels, produced by the U. S. Bureau of Mines.

Among the prominent speakers at the annual dinner of the Salesmen's Association of the Chemical Industry and the exposition meetings were Secretary of Commerce Herbert Hoover, Assistant Secretary of War J. M. Wainwright and Francis H. Sisson, vice president of the Guaranty Trust Co.

Exhibitors May Manage Own Show in Future

A change in the management and method of operation of the Chemical Exposition is planned for the future, according to reports of dissatisfaction on the part of a number of exhibitors. Instead of leaving everything in the hands of a private exposition company which is charged with making unreasonable profits on the enterprise, a committee of exhibitors with a permanent salaried manager is planned and there may be a permanent exhibit of chemicals and chemical machinery in suitable quarters in New York City. Then, once a year this smaller exhibit may be enlarged to the proportions of this year's exposition at Grand Central Palace, under the management of the exhibitors themselves.

A. R. Anderson, sales engineer of C. J. Tagliabue Mfg. Co., Brooklyn, N. Y., has returned from an eighteen months' trip to England and the Continent in the interest of his company. He will make his headquarters at 462 Hippodrome Building, Cleveland, Ohio.

457 Papers Read at Chemical Society's Pittsburg Meeting

1,400 *Chemists in Attendance Among Them Many Rubber Chemists -- $25,000 Annual Prize Offered*

THE registration figures of the American Chemical Society show that nearly 1,400 persons attended and took part in the meeting of the Society at Pittsburg the week of September 4 to 9. This attendance lacks about 200 of the record-breaking meeting held in New York in September, 1921.

The meeting was divided into 16 groups, at which more than 457 papers were given. The Rubber Section held a two-day session at which the progress of rubber chemistry for the last year was given in detail. Among the most important revelations at this meeting was the paper of Frank G. Breyer of Palmerton, Pa., describing a new zinc oxide of smaller particle size than any previous zinc oxide. It is claimed that this material, used as a pigment in tire treads, has given a remarkable increase in mileage.

$25,000 *Annual Prize Announced*

Of chief national interest was the announcement, read by Dr. Edgar F. Smith, president of the society, of an annual prize of $25,000 to be awarded to the chemist who, each year, has made the most valuable contribution to either pure chemical research or applied chemistry or chemical education. This award is the gift of the Allied Chemical and Dye Corporation of New York, through the chairman of the board of the corporation, Dr. W. H. Nichols. Dr. Nichols was formerly president of the American Chemical Society and former president of the Society of Chemical Industry, of Great Britain. He also was president of the Eighth International Congress of Applied Chemistry which held its convention in this country in 1912.

The award is to be made by a jury to consist of seven members, five to be appointed by Dr. Smith and two to be appointed by the corporation, the latter two, however, not to be connected in a business way with the corporation.

World Metric Standardization Conference

During the meeting a conference on world metric standardization was held, attended by the representatives of fifteen engineering and scientific societies, over which Dr. Eugene C. Bingham presided. The progress toward the adoption, in America, of metric units was discussed at length as were methods of accelerating the use of the metric system. Emphasis was placed upon the fact that gradual adoption is the basis upon which this work will be continued, with no attempt at sudden or revolutionary measures in changing from the "English System" or, as Dr. Bingham expressed it, the "lack of system."

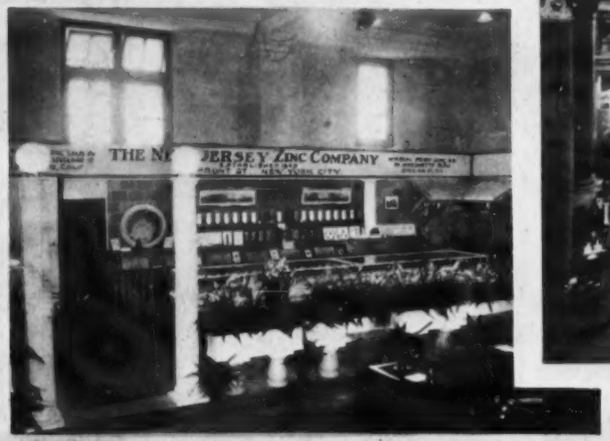
Dr. Charles L. Parsons, Secretary of the American Chemical Society, reported before the Council of the Society, which met on Monday, the arrangement made with The Chemical Society of England for the joint publication hereafter of *The Journal of Physical Chemistry*, and that the Faraday Society, also of England, will co-operate with The Chemical Society in this work. The present editor is Dr. Wilder D. Bancroft of Cornell University, a world authority on physical chemistry.

Nearly 1,000 chemists in attendance at the Pittsburg meeting among whom were many rubber chemists from Akron, Ohio, and other factories, took advantage of the opportunity afforded by the local committee in charge of arrangements to visit the Clairton Works of the Carnegie Steel Company and the plant of the American Glass Company. Other industrial excursions were made on Saturday. The plans for the meeting, carried on under the direction of J. O. Handy, chairman of the Pittsburg Section of the A.C.S. went through without a hitch. Various entertainment features were provided, including a lawn party at the new club house of the Fellows of Mellon Institute and the faculty of the University of Pittsburg. The section meetings were held in the buildings of the Carnegie Institute of Technology and the general meetings in Carnegie Music Hall.

Among the general speakers were Dr. Edwin E. Slosson, editor of Science Service; Dr. John E. Teeple, consulting chemist, New York; Dr. Bancroft; Messrs

(Continued on page 440)

EXHIBIT OF BENZINE CONDENSATION CO., INC., AT CHEMICAL SHOW



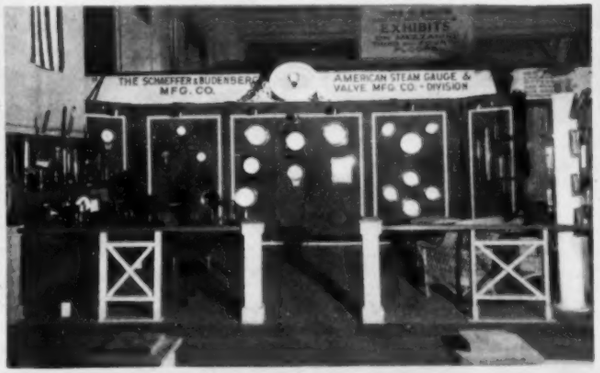
General View of Main Floor

A Few of the Interesting Exhibits at

NATIONAL EXPOSITION of CHEMICAL INDUSTRIES

GRAND CENTRAL PALACE

New York City Sept 11-16.



Chemical Society Meeting

(Continued from page 438)

Midgley and Boyd of the General Motors Research Corp., Dayton, Ohio; Dr. Baker of Carnegie Institute, and Dr. Smith.

Midgley and Boyd demonstrated the effectiveness of anti-knock compounds developed by them. A gasoline motor was set up on the stage of the music hall and the audience listened as raptly as to an opera singer to the clicking sound of detonations in the motor and applauded when, under the influence of di-ethyl selenide and tetraethel lead, the "knock" or detonation was eliminated.

The meeting, as a whole, was declared by officials to be one of the most successful in the history of the society. The next meeting, in the spring, will be held in New Haven. The fall meeting of next year will be in Milwaukee.

The new officers elected for the ensuing year were: W. B. Wiegand, Chairman; Dr. Ellwood B. Spear, vice-chairman; Arnold H. Smith, secretary (re-elected).

More Big Future Contracts

In addition to the forward contract for crude rubber made by the General Rubber Co. of New York, reported in THE RUBBER AGE of Sept. 10, it has been learned that this company has concluded contracts with the Dutch Rubber Co. and the Amsterdam Rubber Co. for 850 tons annually and 1400 tons annually, respectively, through the year 1925. As in the case of the Anglo-Dutch agreement, the prices will be based on the average monthly quotation in the London market, with a minimum of 8d. per pound and a maximum of 1s. 4 d. per pound.

General Rubber Co. has also contracted for two years with various British plantation companies for 660 tons of raw rubber yearly, the buyers to take delivery in Sumatra at the same scale of prices as specified in the Dutch contracts.

It is reported in Amsterdam that the Netherlands Padang and Hessa Rubber companies have concluded future contracts with large American rubber factories for several years ahead, and other Dutch-Indian plantation owners are said to be negotiating with representatives of American plants.

Rubber Football Uniforms

"Pop" Warner, noted football coach of the University of Pittsburg, has invented a rubber football uniform for use on muddy and slippery fields and it may be tried out in the games this fall. Warner says that many games are won and lost each year because of the extra weight which the ordinary padded uniform takes on in wet weather, from rain, snow and mud. Other football coaches and officials will watch this innovation with decided interest, as it may bring about great changes in play and results on soggy, slippery gridirons.

Tire and Rim Association Incorporates

AN event of interest to the automobile industry occurred August 31, when the meeting of the incorporators of The Tire and Rim Association of America, Inc., was held. This new body takes over and continues the activities of The Tire and Rim Association and provides for complete representation of the tire, rim, wheel and related parts industries.

In the early days of the automobile, many tire manufacturers produced their own rims and in several instances tires of other makes would not fit these rims. As the industry grew the manufacture of rims was taken up as a separate enterprise and it soon became evident that standardization was imperative in order to provide complete interchangeability of all makes of tires on all makes of rims.

To accomplish this the Clincher Automobile Tire Manufacturers Association was formed and a line of standard rims worked out. Inspectors were placed in every rim plant and the official stamp of the Association on rims became a guarantee that all makes of tires would fit them. The Association was managed by the executive heads of the member companies and minutes of meetings carried the names of such well known figures as F. A. Seiberling, then president of the Goodyear Tire and Rubber Co. and now president of the Seiberling Rubber Co.; C. J. Butler, president of Morgan & Wright and now also vice president of the United States Rubber Co.; H. S. Firestone, president of the Firestone Tire and Rubber Co.; John Kelsey, president of the Kelsey Wheel Co., and others.

In 1917 the name was changed to The Tire and Rim Association and its management devolved upon the technical executives of the member companies. During the war the association rendered valuable assistance to the government in working out a standardization program to reduce the number of tire sizes and types. The economies resulting from this work were enjoyed by all branches of the related industries and gave a great impetus to the tire standardization movement of today.

The Tire and Rim Association of America, Inc. provides for membership, from the tire, rim, wheel and related parts industries, and is governed by a board of directors composed of fifteen members. Seven of these represent tire manufacturers, four rim, three wheel and one the related parts manufacturers. Election of directors resulted as follows:

TIRES

Firestone Tire & Rubber Co., J. E. Hale;

Fisk Rubber Co., J. D. Anderson;

B. F. Goodrich Co., W. H. Allen;

Goodyear Tire & Rubber Co., B. Darrow;

Hood Rubber Co., E. O. Fritch;

Miller Rubber Co., C. F. Offensend;

United States Rubber Co., S. P. Thacher.

MISS AKRON IN THE FLOAT AT THE HEAD OF THE 1922 BEAUTY PARADE ON THE ATLANTIC CITY BOARDWALK, THE FIRST PRIZE BEING WON BY MISS KATHERINE CAMPBELL OF COLUMBUS, OHIO, WHO IMPERSONATED MISS COLUMBUS. INSERT—MISS DORIS WIDDERSHEIM, STENOGRAPHER AT THE GOODRICH PLANT, CHOSEN BY POPULAR VOTE TO REPRESENT AKRON IN THE ANNUAL CONTEST AT NEW JERSEY'S FAMOUS SEASIDE RESORT

RIMS

Hayes Wheel Co., J. H. Wagonhorst;
Jaxon Steel Products Co., W. B. Minch;
Kelsey Wheel Co., Ford Lawrence;
Standard Parts Co., John Younger;

WHEELS

Budd Wheel Co., P. Pleiss;
Motor Wheel Corp., C. C. Carlton;
Wire Wheel Corp. of America, O. J. Rohde.

RELATED PARTS

A. Schrader's Son, Inc., W. J. Kirkpatrick.

The first meeting of the board of directors was held immediately after the meeting of the incorporators and the following officers were elected: President, S. P. Thacher; vice president, John Younger; secretary, C. A. Thompson; treasurer, H. W. Kranz. Mr. Thompson also remains as General Manager and C. E. Bonnett as chief rim inspector.

The new association covers the entire field of tire and rim standardization while continuing the work of rim inspection and its plans include close cooperation with other bodies engaged in related work. Its immediate goal is the enrolling in its membership of every tire, rim, wheel and related parts manufacturer in the United States and Canada. In addition to the home office of the corporation, in Hartford, the new association will continue to use the offices occupied by The Tire and Rim Association in the Leader-News Building, Cleveland, Ohio.

Quaker City's New Directors

Norman E. Oliver, for more than twenty-five years prominent in the rubber industry, having been a director of the Diamond Rubber Co. and general manager of the B. F. Goodrich Co. of New York, has been elected vice-president and a director of the Quaker City Rubber Co. of Philadelphia. James M. Dixon, president of the Tobacco Products Corp. and a director in several large corporations, has also been placed on the board of directors and expects to acquire a substantial financial interest in the Quaker City Company.

C. A. Daniels, president of the company, founded it in 1885 with nominal capital. It has enjoyed steady growth and large earnings.

Chalk Whiting Marketed

The Krippendorf-Tuttle White Cliffs Products Co., owner and operator of the largest chalk whiting plant and the only deposit in the United States, is just completing the installation of machinery and is about ready to start shipping K-T chalk whiting.Many tests have shown it the equal of if not superior to imported English cliffstone material and, on account of its chalky nature, is of great advantage in rubber compound. The general sales office of the company is at 30 North Michigan Blvd., Chicago. Calvin Stitt has been appointed general sales manager.

Rubber Goods Markets

The Philadelphia Public Ledger of Sept. 6 reports on the rubber goods markets as follows:

Demand for rubber footwear and wearing apparel is strong. Activity in boots and all heavy footwear increased suddenly. There is a steady call for basketball shoes laced at the toes, and orders for next year's summer sports shoes and ties are beginning to be made. The variety of tennis shoes, in colors, sole patterns and the cut of the uppers will be greater next year than during the last season. A woman's Russian boot, made of glazed rubber and trimmed with a wide cuff of astrakhan at the top has been introduced by one manufacturer. The same company is showing a two-buckle galosh for women having a single lace instead of a third buckle at the top. There is also a greater diversity of styles in raincoats. A salesman says that as soon as the popularity of some particular design of cloth or style of overcoat is demonstrated his company copies the garment in rainproof goods. The same company is planning to introduce women's and children's capes made of the same weight rubber as bathing caps. Rubber garments are generally active. Prices are steady and collections fair.

CONGRATULATIONS TO OUR CONTEMPORARY

With the October 1922 issue *India Rubber World* of New York City celebrates its thirty-third year of existence—a fact which excites the highest commendation and praise from the rubber industry both in this country and abroad.

The eminent position it maintains in the rubber trade has been entirely the result of hard work, co-operation, and service to the industry on the part of H. C. Pearson, its editor for one third of a century, and his capable staff.

It is with sincere pleasure that we congratulate *India Rubber World*. May it continue to serve the rubber industry as efficiently for many more generations.

Publishers of THE RUBBER AGE

Lane Moves Uptown

J. H. Lane & Co., cotton commission merchants, have moved their offices from 334 Fourth avenue, New York City, to handsome new offices at 250 West 57th street, at the southwest corner of Broadway. Their new telephone number is Circle 9600.

Iowa Nearly Trebles Capacity

Iowa Cord Tire Co., Inc., Des Moines, has increased its daily capacity from 600 tire casings to 1500 by completing the installation of mill lines, additional mills, boilers, and other equipment.

Safety Platform for 1923

The eleventh annual safety congress of the National Safety Council, at its session in Detroit, Mich., on August 28 adopted the following resolution endorsing a safety platform for 1923:

"*WHEREAS*, the 80,000 accidental deaths and millions of injuries occuring each year on our streets, in our industries, in homes and elsewhere are a blot on American civilization and the cause of untold suffering and sorrow, and

"*WHEREAS*, the direct economic cost of industrial accidents alone exceeds one billion dollars annually, and

"*WHEREAS*, experience has demonstrated that at least 75 per cent of industrial accidents are preventable and that approximately an equal reduction is possible as regards public accidents, therefore be it

"*RESOLVED*: That the National Safety Council in its Eleventh Annual Congress in Detroit assembled advocates:

"1. The safeguarding of all dangerous machinery and places according to standard methods of proved value;

"2. The development of industrial equipment and processes along lines of inherent safety for the double purpose of eliminating accident hazards and increasing production efficiency;

"3. The education of all workmen and their supervisors in safe methods and habits of work;

"4. The training in safety of all school children, as well as students in colleges and universities, both for their own protection and as an object lesson in good citizenship;

"5. The adoption and strict enforcement of uniform, practicable laws and ordinances for the safeguarding of vehicular traffic and the protection of the multitude of law abiding drivers and pedestrians against the thoughtlessness and recklessness of the few; and

"6. The mobilization of all community forces through state and city safety councils for securing those ends through the overwhelming force of enlightened public opinion."

Empire Assets Sale

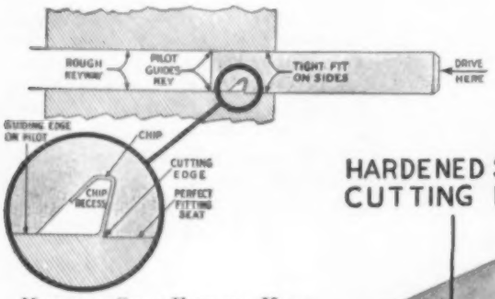
At the receivers' sale of the Empire Tire & Rubber Corp. in Trenton, N. J., Sept. 13 the assets of the company were sold to Campbell, Heath & Co., brokers, of 5 Nassau street, New York City, for $1,675,000. William H. Peck, president of the Third National Bank of Scranton, Pa., bid in the property for the firm. W. W. Pepper, treasurer of the brokerage firm, was formerly president of the Empire company.

A new company to operate the plant will be organized, it is stated, with C. Edward Murray, jr., of Trenton, as president.

The Empire concern is said to owe several banks $350,000, the Baird Rubber Co. of New York $122,000, and Bright Mills, Inc., $78,000.

Keytite Self-Fitting Keys

In the rubber industry keys are used to make the driving connection between shafts and couplings, gears, sprockets, pulleys, etc. It is usual to mill or slot the keyway in the shaft and to slot the keyway in the external member. But both of these keyway sizes will vary slightly and to obtain the desired tightness between the key and keyways it has been necessary to carefully fit the parts together. This has usually been done by hand, either by filing the key to fit the keyways or by filing or scraping the keyways to fit the key.



KEYTITE SELF-FITTING KEYS

It usually takes a good mechanic three or four hours to fit an ordinary 1½" x 1½" key. A key slightly small, say 1" x 1", may require only two hours and in exceptional cases may be fitted well enough in an hour. But the mechanic needs to be experienced and the key and keyways need to be almost the right size to start with in order to obtain even these results. Such hand fitting generally is quite expensive work and the results are not always satisfactory.

In the new Keytite Self-Fitting Keys a tough chisel stock is used and this is ground to a size very slightly larger than the nominal keyway width. A cutting edge and chip recess are provided near the front end of the key. Ahead of these is a pilot slightly smaller than the nominal keyway width.

To install one of these keys the pilot is entered first with the cutting edge at the side. Then the key is driven home with an ordinary machinist's hammer or with a sledge, depending upon the size of the key. The cutting edge sizes the keyways to make a tight fit between the body of the key and the keyways.

In the larger sizes cutting edges are sometimes provided on both sides. When it is desired to fit top and bottom as well as on the sides, a cutting edge is also provided at the top. Gib keys and other modifications can be furnished as required, all with this self-fitting advantage which saves the cost of hand fitting and which always provides that the key will be a tight fit in the keyways.

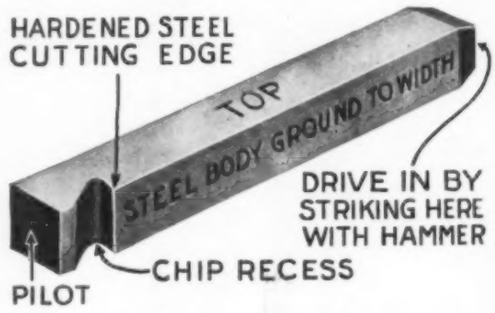
Bruce "Scotty" Bierce now heads the newly established engineering sales department at the Akron plant of the Rubber Engineering Co. He was formerly a professional football player, and is a graduate of Akron University.

New Sturtevant Bulletin

The B. F. Sturtevant Co. of Hyde Park, Boston, Mass., has just issued a new 72-page Engineering Bulletin on Pneumatic Collecting and Conveying.

It contains thirty-three pages of pictures and diagrams, seventeen pages of useful tables—how to find the size of fans, the suction, volume, r.p.m. and horsepower for any system, cubic feet of air handled per minute, size of pipe and ducts used, and various other valuable tables.

Data is also given on dust collecting from grinding and polishing machines, tumbling barrels, sand blast machines, coal brakers, shoe machinery and the removal of fumes, gases, etc. In addition, there are parts on the conveying of pulverized coal, fibrous materials, coffee, ashes, wool, wood chips, etc., etc. It is a most comprehensive treatise on pneumatic collecting and conveying systems. A copy will be sent on request.



Seiberling Sells Akron Home

C. W. Seiberling, vice president of the Seiberling Rubber Co. and a former official of Goodyear, has sold to M. O'Neil, president of the General Tire & Rubber Co., his estate "Triacre," said to be one of the finest homes in the West Hill district of Akron. Mr. Seiberling will make his permanent residence at his country place "Old Acres" at Northfield, Ohio.

U. S. Exhibit at Clothiers Show

The United States Rubber Co. was an important exhibitor at the clothiers' show held recently in Madison Square Garden, New York City. A new feature consisted of single textures for spring raincoats, made with rubber vulcanized on cloth instead of having the rubber between the two fabrics. Hats and belts containing rubber were a part of the interesting exhibit.

Rubber Ass'n Annual Dinner

The next annual dinner of the Rubber Association of America will take place on Jan. 8, 1923, at the Waldorf Hotel, New York City. There will be the usual business meeting in the afternoon and the banquet in the evening. About 1,000 are expected to attend the dinner.

Republic Report Shows Loss

For the six-month period ended June 30, 1922, the Republic Rubber Corp. of Youngstown, Ohio, showed a net loss of $21,664.53 after various charges aggregating $232,731.24, according to the receiver's report just made to the U. S. court. Net sales for the period were $2,467,109, an average of $411,185 monthly. The items constituting the reserve consists of $121,398 for general depreciation; $11,415 for insurance; $35,834 for taxes, and $64,084 for extraordinary repairs.

The balance sheet as of June 30, shows a net worth of $3,867,271.13. This means there is no tangible equity either for common or second preferred stock as there is outstanding $6,753,200 of first preferred.

The balance sheet also disregards disputed claims aggregating $3,250,000. These represent merchandise and miscellaneous commitments which the receiver has refused to allow.

Current assets of June 30 are shown as $3,602,412, including $291,345 of cash. Current liabilities incurred by the receiver and subsidiaries: $1,343,817. Of these liabilities $970,000 are 7 per cent receiver's certificates of indebtedness. Corporation and company liabilities prior to the receivership aggregate $2,710,144 additional, making a total of $4,053,961. A miscellaneous reserve of $125,649.84 is reported. Gross assets are given as $8,046,882.79.

Dunlop $10,000,000 Bond Issue

The Dunlop Rubber Co. of London, England, is reported to be contemplating an issue of $10,000,000 in bonds secured by a first mortgage on its $20,000,000 plant in Buffalo, N. Y., which has been standing idle for the past year. The British company will also guarantee payment of principal and interest on the bonds, it is stated. Debenture stock in the amount of £3,000,000 is on deposit with British bankers as collateral for loans which were made principally to finance the construction of the Buffalo plant. The company feels that it has saved money by allowing the American factory to remain idle, because of declining tire prices and poor business conditions in general on this side of the Atlantic.

Intercontinental Finances

The stockholders of Intercontinental Rubber Co. have approved the plan of financial reorganization calling for the formation of a new company to be known as Intercontinental Rubber Products Corp. capitalized at 604,000 shares, no par value, and an authorized issue of $2,903,000 seven per cent ten-year convertible collateral trust notes. The new concern will acquire in exchange for 31,370 shares of stock the assets of the present subsidiary companies.

The Lastik Lined Barrel

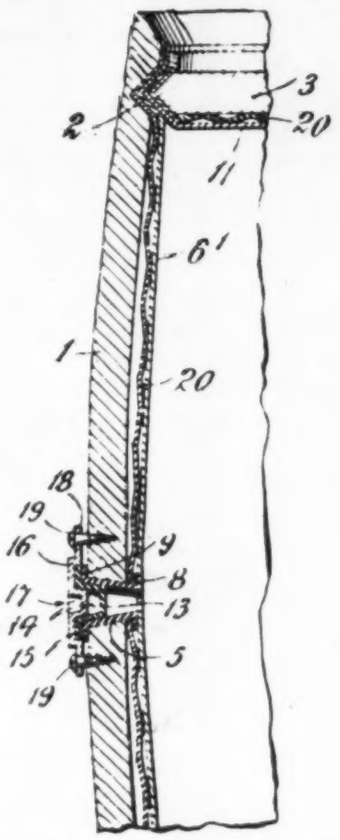
The Lastik Lined Barrel, which has been used for several years as a container for chemicals by the American Chemical Paint Co., 1118-1126 S. 11th St., Philadelphia, is said to have produced excellent results. It is manufactured by the Cleveland Cooperage Co., Cleveland, Ohio.

In the past the paint company shipped its products in regular oak barrels, but this quickly demonstrated objectionable features because of the large percentage of leaks in transit and when required to store the products for any length of time, practically all of the barrels leaked, which necessitated the transfer of the contents.

The rubber-lined barrel was then developed and has gone through a process of many changes and revisions.

An ordinary six or eight hoop barrel, in accordance with I.C.C. Specifications Nos. 9 and 10, is used and into which is inserted a crimped paper bag as indicated by No. 20 on the illustration. This serves to prevent small splinters, on the inside of the barrel, from puncturing the rubber lining when the barrel is being filled. It has a further object of allowing for a certain amount of expansion and contraction due to pressure inside the containers.

A cylinder made of pure sheet rubber, as indicated by No. 6 on the drawing, is inserted in the barrel and to this cylinder is cemented the neck (No. 5), which is drawn out through the bunghole in the bilge of the barrel. Sheet rubber heads (No. 11) are cemented to the cylinder (No. 6) at the time of coopering the barrel.



CROSS-SECTION OF THE LASTIK LINED BARREL. THE MEANING OF THE NUMBERS IS EXPLAINED IN THE ACCOMPANYING TEXT

A molded rubber stopper (No. 13) prevents the escape of the contents through the bung and this is held in place with the pressed steel plate (No. 16), which is screwed to the barrel with four wood screws (No. 19).

The Lastik barrel has up to this time been used only for A.C.P. Co. products, but has recently been taken over by the Cleveland Cooperage Co. who will distribute it as a container for any liquids or materials which may be carried without injuring pure rubber.

The Lastik barrel, in addition to affording a leak-proof container, will prove of value in that it may be used to store material for many months and may also be used a number of times; in fact, it may be refilled until the life of the rubber has become exhausted.

A fifty-gallon Lastik barrel weighs approximately the same as a twelve-gallon carboy, so that a material saving in freight is effected in transportation of products from the source to the consumer. The twelve-gallon carboys are usually returned to the chemical works but in the case of the barrel, it may be used once and discarded; or, if desired, it may be used several times for various purposes without returning it empty to its source.

$100,000 Fire in Akron

The rubber reclaiming plant of Leo Meyer Co., North and Furnace streets, Akron, Ohio, was destroyed by fire on Sept. 5 with a loss estimated at $100,000. Low water pressure handicapped the firemen and added to the loss.

Kaye Corporation Formed

It is reported from London that a company has been formed to take over the patents of the invention by Frederick Kaye, A.R.C.Sc., relating to the use of rubber latex (liquid rubber) in papermaking. Successful tests of the process are said to have been carried out in several paper mills in England and numerous applications have been made for process rights for various countries in which applications have been made for the patent. The company is Kaye's Rubber Latex Process, Limited, 161 New Bond Street, London, W., capitalized for £12,000 in 10,000 10 per cent ordinary £1 shares and 40,000 deferred 1s. shares. No public issue of shares is being made, but the prospectus states that application will be made to the Stock Exchange committee for permission to deal in the shares after allotment.

D. F. L. Zorn, stockbroker chairman of the Rubber Shareholders' Association, is chairman of this new company, and the other directors are James Fairbairn, chairman of the Amalgamated Rubber Estates; E. D. Money, of Boustead Bro.; S. Van den Bergh, Frederick Kaye, and Mrs. M. Kaye.

Goodyear Plant on 4-Day Basis

P. W. Litchfield, vice president and factory superintendent of Goodyear, recently announced to the industrial assembly of workers that working hours at Plant 2, with the exception of the clincher cord tire department, will be four days weekly. Other divisions of the factory are not affected.

$100,000 Plant for Po'keepsie

The Corrugated Rubber Corp., capitalized at $1,500,000, which has been conducting an experimental station in New Jersey, will build a plant to cost $100,000 on a five acre tract in Cedar street, Fairview, a suburb of Poughkeepsie, N. Y. William J. Beardsley drew the plans for the factory which will be up-to-date in every respect.

Heather Heel Receivership

Attorney A. C. Calhoon, of Lorain, Ohio, has been appointed receiver for the Heather Rubber Heel Co. of that city. Suits for $605 are pending against the company which was organized by local capital.

Stockton, N. J., Plant Reopens

The B. C. Tillangehast Rubber Mfg. Corp., incorporated for $100,000, has taken over the Stockton Rubber Co. plant at Stockton, N. J., formerly in receiver's hands, and expects to have it ready for operation by Oct. 15. It is said that $30,000 worth of new machinery has been installed and about fifty people will be employed. Officers of the new company are: Walker Smith, of Minneapolis, president; W. J. McLaughlin, of Detroit, vice president and general manager; Dominick Price, secretary and treasurer. A Philadelphia concern has contracted for the output of the plant for the next five years.

Reading to Make Tubes

Reading Rubber Co., Kutztown, Pa., capitalized at $200,000, will soon engage in the manufacture of inner tubes for tires and swimming tubes. A two-and-one-half story building with basement has been purchased, also another two-story building, which after alterations will be used as inner tube mills. President S. H. Bell recently returned from a trip during which he bought the necessary machinery to equip the factories.

MARKETS

Cottons and Fabrics

NEW YORK, September 15, 1922

THE Federal estimate on the condition of the cotton crop showed a drop of 13. 8 per cent; the most drastic decline ever recorded within a single month. It means a reduction of 874,000 bales and leaves the total crop 10,575,000 bales——compared with 7,-953,641 last year, 13,439,603 in 1920 and a ten year average of 13,053,630. The estimated condition of 57 can be compared with 70.8 last month; 71.2 on June 25; 49.3 a year ago; 67.5 in 1920 and a ten year average of 65.3. No explanation for the unparalleled reduction was given. Curiously enough, when the government announced its estimate, cotton prices dropped $5.00 a bale when the known facts seemed to warrant just the reverse action; owing perhaps to some doubts as to requirements for the next twelve months and maybe to skepticism as to the worth of cotton estimates.

As to probable consumption of cotton a very recent report (Sept. 9) of the Commerce Department gives material for some thought. It shows that the world's trade in cotton has decreased approximately 2,000,000,000 pounds or about one-third from the pre war figure. The twelve principal cotton importing countries of the world imported in 1921 4,412,-000,000 pounds as compared with a total of 6,451,000,000 pounds in 1913. The six principal cotton-producing countries exported in 1921 an aggregate of 4,697,-000,000 pounds as against 6,748,000,000 pounds in 1913. All the principal countries of the world showed decreases of exports in 1921 compared with 1913—— the United States, showed a decrease of about 25 per cent, Egypt, 40 per cent, India, 33 per cent, Peru, 35 per cent.

Some astonishment was shown at the department's first report on cotton ginning. Up to September 1 the large amount of 817,171 bales of cotton had been ginned whereas at that time last year only 485,787 bales were ginned, an increase of nearly 70 per cent.

Another interesting development during the period under review was the return to this country of American cotton that was held in Bremen and Hamburg on account of German buyers. This cotton is largely 1 1/16 to 1⅛ staple and it is reported that between 40,000 and 50,000 bales will be returned owing to the financial collapse in Germany.

EGYPTIAN AND PIMA

Egyptians were more active during the first weeks of the month with medium uppers quoted from 27½ to 29½ cents; medium grade Saks being offered 41 to 42½ cents. Highest grade Sak could be had at 45 to 48 cents.

The demand for Pima cotton was very quiet. The new crop was offered at 38 to 39 cents for No. ones; 36 to 37 cents for No. twos, and 34 to 35 cents for No. threes.

EXTRA STAPLE COTTON

There were more inquiries and offerings during the last week than for many weeks although very little change in prices was noted. In the shorter lengths there has been a slight reduction, inch and an eighth, strict middling, being offered at 28½ cents, with middling as low as 26½ cents. The general level for strict middling, inch and an eighth was 29 to 30 cents and middling of the same length 27½ cents. Sales were reported of inch and three sixteenths at 32 to 33 cents for strict middling. Prices for inch and a quarter ranged generally from 35 to 36 cents for strict middling.

Prices on extra staple cotton, strict middling in grade and color, f.o.b. New Bedford, were quoted as follows:

1⅛ inch—28 to 30 cents
1 3/16 inch—31 to 33 cents
1¼ inch—33½ to 35 cents
1 5/16 inch—36 to 38½ cents
Egyptian Uppers, medium—27½ to 29½ cents
Peruvian Mitafifi—20 to 30 cents
High Grade Sak—45 to 47 cents
Sea Island, average extra choice—43 to 45½ cents

TIRE FABRICS

Buying is somewhat curtailed in the tire fabric market as there is a feeling that production will slow down during the next few months. Many of the larger tire companies have contracted for several months ahead and the smaller companies are buying only for immediate needs.

Prices quoted on fabric show a wide range and some of the prices here given can probably be shaded somewhat.

CORD FABRICS

Combed Sakellarides		.81	@	.85
Carded Sakellarides	lb.	.75	@	.78
Combed Peeler	lb.	.65½	@	.70
Carded Peeler	lb.	.54	@	.58
Combed Egyptian uppers	lb.	.68	@	.70
Carded Egyptian uppers	lb.	.60	@	.65

SQUARE WOVEN

17¼-ounce Egyptian uppers, combed	lb.	.64	@	.67
17¼-ounce Egyptian uppers, carded	lb.	.55	@	.62
17¼-ounce Sakellarides, combed	lb.	.78	@	.82
17¼-ounce Sakellarides, carded	lb.	.70½	@	.73
17¼-ounce Peeler, combed	lb.	.60½	@	.65
17¼-ounce Peeler, carded	lb.	.50	@	.56

SHEETINGS—The market was very active and business was in large volume. There was good interest in 40-inch, 3.60 yard at 11¾ cents; 40 inch, 4.25 yard, bringing .09¼ cents; 40 inch 2.50 yard, 14¼ cents and 40 inch, 2.85 yard, 12 to 12¼ cents.

DUCKS—Higher prices ruled in the ducks markets and the enthusiasm that prevailed was attributed to the general broadening of business throughout the country. Single filling brought 18½ to 19 cents and double filling, 20 to 21½ cents, prices varying according to grade. Enamelling was 40 to 42 cents a pound in first hands, depending on width and make.

BURLAPS — Shipments of burlaps from Calcutta to North American ports during August amounted to 86,500,000 yards of which 83,000,000 yards were shipped to East Coast ports. August shipments exceeds those of June by more than 50,000,000 yards and brings the 1922 total to September 1 up to 624,455,000 yards or a monthly average of about 78,000,000 yards.

SHEETINGS

40-inch 2.50-yard	yd.	.14¼	@	.14½
40-inch 2.85-yard	yd.	.12	@	.12¼
40-inch 3.15-yard	yd.	.13½	@	—
40-inch 3.60-yard	yd.	.11¾	@	—
40-inch 3.75-yard	yd.	.10	@	—
40-inch 4.25-yard	yd.	.09¼	@	—

DUCKS

Belting	lb.	.36	@	.38
Hose	lb.	.36	@	.38
Enameling	lb.	.40	@	.42
Shoe Ducks	lb.	.49	@	.51
Single Filling	lb.	.18½	@	.19
Double Filling	lb.	.20	@	.21½

BURLAPS
(Carload Lots)

8 -ounce 40-inch	100 yds.	6.70	@	6.75
7½-ounce 40-inch		6.65	@	6.70
10 -ounce 40-inch		8.95	@	9.00
10½-ounce 40-inch		9.15	@	9.25

DRILLS

37-inch 3.25-yard	yd.	.12	@	—
37-inch 2.75-yard	yd.	.13½	@	—
37-inch 3.00-yard	yd.	.12¾	@	—
37-inch 3.50-yard	yd.	.11½	@	—
37-inch 3.95-yard	yd.	.10¼	@	—

OSNABURGS

30-inch 7-ounce		.13	@	.13½
40-inch 7-ounce		.13½	@	.14

COTTON EXPORTS FROM ALEXANDRIA

Alexandria, August 25, 1922

	Receipts Alexandria Cantars	Exports in Bales to England	Continent	America	Total Exports Cantars	Stock Alexandria Cantars
This week	5,754	4,377	3,014	1,300	66,254	1,464,301
Same week 1921	29,813	2,618	3,036	——	43,101	1,947,707
" " 1920	3,116	1,267	772	——	15,463	519,371
Since 9/1/1921	5,352,258	346,767	239,162	166,614	5,722,957	——
Same time 1920	4,919,364	222,000	168,850	50,495	3,369,859	——
" " 1919	5,579,318	343,154	133,054	252,058	5,502,947	——

Chemicals and Compounding Ingredients

THE INDUSTRIAL CHEMICAL MARKET—NEW YORK, SEPTEMBER 18, 1922—The decided improvement in demand which was evident during the last week encourages the hope that the fall season about to open will be an active one. There has been for some time a more or less unsettled feeling owing to the uncertainty as to the time of final action on the tariff bill. The better tone that prevails is due in a measure to the feeling of relief that this disturbing influence will soon be removed. With the tariff definitely fixed, the coal strike ended and the rail transportation troubles terminated, most of the difficulties and uncertainties that have hampered domestic manufacturers will be out of the way. At the present time there is a notable scarcity of many important items.

ACCELERATORS

Organic

Aldehyde ammonia, crystals	lb.	$ .90 @	.95
Aniline oil, bulk basis,	lb.	.14 @	.15
Excellerex,	lb.	.35 @	.40
Formaldehyde-Aniline	lb.	.45 @	.50
Hexamethylene-tetramine	lb.	.70 @	.72
Paraphenylenediamine	lb.	1.55 @	1.57
Thiocarbanilide	lb.	.26 @	.35
Vulcocene	lb.	.35 @	—

Inorganic

Lead, dry red bbls.	lb.	.09 @	.09¼
Lead, white, basic carbonate	lb.	.07¼ @	.08
Litharge, domestic	lb.	.08½ @	.08¾
imported	lb.	.17 @	—
Lime, Superfine	lb.	.02 @	.02½
Magnesia, calcined, light,	lb.	.23 @	.24
extra light	lb.	.45 @	—
heavy	lb.	.05 @	.05½
Orange Mineral	lb.	.12 @	.14

COLORS

Blacks

Carbon Black	lb.	.16 @	.20
Micronex	lb.	.17 @	24
Lamp Black	lb.	.12 @	.40
Bone "	lb.	.05½ @	.07½
Drop "	lb.	.07½ @	.16
Ivory "	lb.	.15 @	.45

Blues

Prussian	lb.	.55 @	.60
Ultramarine	lb.	.08 @	.35
Cobalt	lb.	.21 @	.26

Browns

Iron oxide	lb.	.04 @	.05
Sienna, Italian,	lb.	.05½ @	.14
Umber Turkey,	lb.	.04 @	—
Vandyke, domestic		.03½ @	.04½

Greens

Chrome, light, c. p.	lb.	.30 @	.32
medium	lb.	.35 @	.36
dark	lb.	.36 @	.45
commercial	lb.	.12 @	—
Rubber Makers Green	lb.	3.50 @	—

Reds

Antimony, crimson	lb.	.40 @	—
golden	lb.	.27 @	—
red sulphuret	lb.	.20 @	.22
Indian, English, pure	lb.	.12 @	.15
Para toner	cwt.	1.00 @	1.10
Rubber makers red	lb.	3.50 @	—
purple	lb.	2.50 @	—
Toluidine toner	lb.	2.10 @	—
Tuscan red	lb.	.17½ @	.35
Venetian red	lb.	.03½ @	.06
Vermillion, quicksilver, English	lb.	1.15 @	—
domestic	lb.	.25 @	.30

Whites

Albalith	lb.	.06 @	.06½
Aluminum bronze	lb.	.55 @	.60
Azolith	lb.	.06 @	.06½
Lithopone, domestic (factory)	lb.	.06¼ @	.06½
Zinc oxide. American Horse Head Special	lb.	.07½ @	.08
XX red	lb.	.07 @	.07½
American Azo: ZZZ (lead free)	lb.	.07 @	.07½
ZZ (under 5 per cent leaded)	lb.	.06¼ @	.06¾
Z (8-10 per cent leaded)		.06 @	.06¼
Zinc oxide, French process, White seal	lb.	.11 @	.11½
Green seal	lb.	.09¾ @	.10¼
Red seal	lb.	.08¾ @	.09¼

Yellows

Chrome, light, c. p.	lb.	.16 @	.17
dark	lb.	.16 @	.17
medium	lb.	.16 @	.17
Ocher, French	lb.	.02½ @	.03½
domestic	lb.	.02½ @	.03
Rubber Makers' Yellow,	lb.	3.50 @	—

COMPOUNDING INGREDIENTS

Aluminum flake	ton	25.00 @	30.00
hydrate	lb.	.17 @	.18
Ammonia carbonate,	lb.	.06¾ @	.08¾
Barium carbonate	ton	60.00 @	63.00
Barium Dust	lb.	.04½ @	—
Barytes, southern off-color,	ton	.15 @	.17
Western, prime white,	ton	23.00 @	—
Basofor	lb.	.04¾ @	—
Blanc fixe, dry, f.o.b. works	lb.	.04¼ @	.04½
Carrara filler	ton	18.00 @	—
Chalk, precipitated, extra light	lb.	.03½ @	.04¼
heavy	lb.	.02½ @	.03¼
Clay, China, domestic,	ton	15.00 @	16.50
imported	ton	15.00 @	22.00
Dixie	ton	20.00 @	30.00
Blue Ridge	ton	22.00 @	32.00
Fossil flour	ton	60.00 @	—
Glues, extra white	lb.	.30 @	.40
medium white	lb.	.20 @	.26
cabinet	lb.	.18 @	.30
cabinet low grade	lb.	.15 @	.18
common bone	lb.	.08½ @	.14
Graphite flake, bbls.	lb.	.06½ @	.12
amorphous	lb.	.05 @	—
Infusorial earth, powdered	ton	60.00 @	—
bolted	ton	65.00 @	—
Mica, powdered	lb.	.15 @	—
Rotton Stone (powdered)	lb.	.02½ @	.04½
Silica (gold bond)	ton	40.00 @	50.00
Soapstone, powdered	ton	15.00 @	20.00
Starch, powdered corn	cwt.	2.85 @	2.95
Talc, domestic	ton	15.00 @	18.00
French	ton	22.50 @	30.00
French, high grade	ton	40.00 @	45.00
Italian,	ton	44.00 @	55.00
Terra Alba	ton	23.00 @	—
Tripoli, white	ton	27.50 @	32.50
Whiting, commercial	cwt.	1.10 @	—
Quaker	ton	13.00 @	15.00
English cliffstone	cwt.	1.70 @	1.90
gilder's bolted	cwt.	1.15 @	1.25
Paris white American	cwt.	1.35 @	1.45
Wood pulp XXX	ton	27.50 @	—
" " X	ton	22.50 @	—
Zinc Oxide— 5 per cent leaded		.06¼ @	.06¾
10 per cent lead sulphate	lb.	.06 @	.06½
20 per cent lead sulphate	lb.	.06 @	.06½
35 per cent lead sulphate	lb.	.06 @	.06½

(Also see whites)

MINERAL RUBBER

Gilsonite	ton	70.00 @	—
Genasco (factory)	ton	50.00 @	—
Hard hydrocarbon	ton	32.00 @	42.00
Soft hydrocarbon	ton	30.00 @	36.00
Pioneer M.R.	ton	42.00 @	44.00
320 M. P. hydrocarbon (c. l. factory)	ton	45.00 @	50.00
300/310 M. P. hydrocarbon (c. l. factory)	ton	40.00 @	43.00
Syntro, granulated, M.R. (factory)	ton	65.00 @	75.00

SOFTENERS

Acids

Acetic, 28 per cent	cwt.	2.67 @	2.92
Phenol	lb.	.18 @	.21
Cresylic, 97 p. c.	lb.	.56 @	.58
95 p. c.	lb.	.51 @	.53
Muriatic, 20 degress	cwt.	1.10 @	1.25
Nitric, 36 degrees	cwt.	4.75 @	5.25
Sulphuric, 66 degrees	ton	15.00 @	16.00
60 degrees, bulk	ton	9.00 @	11.00
Tartaric, crystals	lb.	.30 @	—

Alkalies

Caustic soda, 76 p.c.	cwt.	3.60 @	3.75
Soda ash, 58 p.c.	cwt.	1.95 @	2.30

Oils

Castor, No. 3, bbls.	lb.	.12½ @	—
Corn, crude, bbls.	lb.	.09¾ @	—
refined	lb.	.11½ @	—
Chinawood, bbls.	lb.	.12¾ @	.13
Cottonseed,	lb.	.08½ @	.09
Glycerine, drums	lb.	.17 @	.17½
Linseed, domestic	gal.	.82 @	.83
imported	gal.	.84 @	.85
Palm, Niger		.06 @	.06¼
Lagos	lb.	.07 @	.07⅛
Peanut, domestic, crude	lb.	.11¾ @	.12
Petrolatum, amber	lb.	.04⅛ @	.04¼
dark amber	lb.	.03⅝ @	.03⅞
Pine, steam distilled	gal.	.90 @	—
Rapeseed, refined	gal.	.82 @	.83
blown	gal.	.90 @	.95
Rosin, first rectified	gal.	.39 @	—
second rectified	gal.	.41 @	—
Tar, commercial	gal.	.31½ @	—
Soya Bean		.12 @	—
Petrolatum, standard	lb.	.05 @	.08

Resins and Pitches

Cumar resin, hard	lb.	.09 @	.14
soft	lb.	.09 @	.14
Tar Retort	bbl.	10.00 @	—
kiln burned	bbl.	12.50 @	—
Pitch, Burgundy	lb.	.05 @	.06
coal tar	ton	.01½ @	—
pine tar		.03 @	—
Rosin, grade K	bbl.	6.65 @	—
Strained	bbl.	6.00 @	—
Shellac, fine orange	lb.	.90 @	—

Solvents

Acetone, drums	lb.	.10½ @	.12
Alcohol, denatured, No. 1 bbls.	gal.	.34 @	.38
Benzol, 90 per cent	gal.	.27 @	.32
pure	gal.	.30 @	.35
Carbon bisulphide,	lb.	.06 @	.07
tetrachloride	lb.	.09½ @	.10½
Dimethylaniline	lb.	.35 @	—
Motor gasoline, steel bbls.	gal.	.25 @	—
Naptha, V. M. & P.	gal.	.24 @	—
Toluol, pure	gal.	.30 @	.35
Turpentine, spirits	gal.	1.23 @	—
wood	gal.	1.12 @	—
Paracymene	lb.	.15 @	—

Waxes

Beeswax	lb.	.38 @	.42
Carnauba, No. 1		.20 @	—
Ceresin, white	lb.	.09 @	.10
Bayberry		.20 @	.24
Montan, crude	lb.	.03¾ @	.04
Ozokerite, black,	lb.	.15 @	.17
green	lb.	.26 @	.27
Paraffine	lb.	.02¾ @	.03
Sweet wax	lb.	.12 @	—

SUBSTITUTES

Black	lb.	.08 @	.14
White	lb	.09 @	.16
Brown	lb.	.10 @	.15
Brown factice	lb.	.08 @	.14
White factice	lb.	.09 @	.16

VULCANIZING INGREDIENTS

Lead, black hyposulphite (black hypo)	lb.	.25 @	.35
Sulphur chloride (jugs)	lb.	.13½ @	—
Sulphur flour pure	cwt.	2.00 @	2.40
Bergenport pure	cwt.	2.55 @	2.90
superfine, 100 p. c.	cwt.	2.60 @	3.15

Zinc Oxide—This material is moving more freely than before the recent price reduction. The demand however is coming from sources other than the tire manufacturers who have been very conservative buyers during the last two weeks. Prices remain the same: French process, red seal, car lots 9 cents; less than car lots, 9¼ cents; green seal, car lots, 10 cents; white seal, car lots 11 cents. American process lead free, car lots, 7½ cents; 5 per cent, lead sulphate, car lots 6½ cents; 10 to 35 per cent, 6¼ cents.

Lithopone — Consumption continues heavy and makers of this material are well sold ahead. The coal shortage has not caused any curtailment in production. Domestic remains the same, 6 cents per pound in bags; 6¼ cents in barrels, car lots and 6½ cents in barrels less than car lots.

Litharge—The demand was only fair but more interest is being shown in this market than in previous periods. Prices remained unchanged: Casks 8½ cents to 8¾ cents; 100 pound kegs, less than 500 pounds, 12½ cents; 500 to 2000 pounds, 11¼ cents; 2,000 to 10,000 pounds, 10.8 cents.

Blanc Fixe—Stocks in hand at the present time are very small owing to the difficulty producers have had in getting shipments of raw materials. Prices however remain unchanged at 4¼ to 4½ cents a pound for dry and $40 to $50 for pulp.

Barytes—There was a good demand and consumption is heavier than it was at this time last year. Prime Western was quoted at $23, f.o.b. mines.

Orange Mineral — The market was steady with a fair demand and prices remained unchanged. Domestic was quoted at 12 to 14 cents per pound; English 13¾ cents; German, 14 cents; French, 15 cents.

Carbon Bisulphide—The demand has been sufficient to take care of all surplus stocks and the market continues very firm. Prices held well at 6 cents to 7 cents per pound.

Carbon Tetrachloride—Supplies were light and the market was fairly active with makers asking 9½ to 10½ cents per pound according to quality.

Caustic Soda—Plants have been operating at capacity in order to take care of the enormous demand. There was some talk of an advance in prices but no changes have been made as yet. Standard brands could be had on spot at $3.75, ex-store, for domestic consumption.

Soda Ash—The fuel shortage has resulted in higher production costs but no advance in prices was made by the leading producers.

Crude Rubber

NEW YORK, Sept. 18, 1922

THE two-day flurry in the spot rubber market last week created for a time more excitement than has been noted for weeks; in fact, since the announcement of the proposed British plan for the restriction of rubber production on Eastern plantations. The price of First Latex, spot, went up to the neighborhood of 15 cents and those who were "bullish" on the market were freely predicting a cent or two further advance. The immediate cause of the rise was the conference in London of rubber growers and their representatives at which the Stevenson plan of pooling 100,000 tons of rubber stocks, to be held in reserve, was discussed and many of those present voted in favor of the pooling arrangement.

Importers and dealers in the New York market, however, do not seem to place any great amount of faith in this proposed pooling scheme or, indeed, in any restriction plan at the present time. The best evidence of this lack of confidence on the part of American traders was found in the inevitable reaction which set in and which is still in progress in the local market. Spot rubber is now down to around 14½ cents.

One reason for lack of faith in any restriction or pooling plan is the lamentable fact that the actions of the Chinese rubber producers in India cannot be controlled. Their plantation costs are much lower than the British and are lower even than the Dutch who seem to be satisfied with moderate profits on present and future contracts. Altogether, the outlook for higher prices is rather remote and buyers seem to have things pretty much their own way.

Quotations of this date are practically as follows:

Plantations			
Ribbed Smoked Sheets	.14¼	@	—
First Latex, spot	.14⅝	@	.14½
October/December	.14½	@	—
January/March	.14⅝	@	.15
January/April, May, June	.15⅛	@	—
Amber Crepe No. 1	.14⅜	@	—
" " " 2	.14⅛	@	—
" " " 3	.14	@	—
Light Clean Thin Brown Crepe	.13¾	@	—
Commercially Clean Thin Brown Crepe	.13¼	@	—
Specky Brown Crepe,	.12¾	@	—
Roll Brown Crepe, spot	.12⅛	@	—
Paras			
Madeira Fine	.21½	@	—
Acre Fine	.19¾	@	—
Up-river Fine	.18¾	@	.18⅞
Up-river Medium	.17½	@	—
Up-river Caucho Ball (shipment)	.13½	@	—
Islands Fine	.17½	@	—
Islands Medium	.16	@	—
Islands Coarse	.08½	@	—
Cameta	.08½	@	.08¾
Xingu Ball	.10¾	@	—
Tapajos Fine	.17½	@	.17¾
Pontianac			
Prime Pressed	.11¾	@	—
Plantation	.06	@	—
Bangermassin-Palembang	Nominal		
Siak Gutta Percha	.15	@	—
Prime Macassar	2.55	@	—
Balata			
Panama Block	.40¼	@	—
Surinam Sheets	.68	@	—
Columbia Block	.41½	@	—
Venezuela Block	.49	@	.51

Reclaimed Rubber

NEW YORK, Sept. 18, 1922

No radical changes from our last recorded prices have been noted in the reclaimed rubber market, and the plants in this branch of the industry are still "marking time", so to speak. Operations are confined strictly to manufacturing needs. New and improved methods of reclaiming or regenerating rubber, constantly being discovered in this country and Europe, may lead ultimately to the wider use of reclaims in various branches of rubber manufacture.

Quotations of this date are nominally as follows:

Standard Reclaims			
Floating	.12	@	$.13
Friction	.12	@	.13
Boots and Shoes	.09¾	@	.10½
Boots and Shoes (washed)	.12½	@	.13½
Mechanical	.08	@	.10
Hose	.10	@	.11
Tires, truck	.09	@	.10
Tires, auto	.09	@	.10
White	.12	@	.13

Scrap Rubber

NEW YORK, Sept. 18, 1922

There is practically no activity in this market at the present writing and as a consequence of the lessened activity, prices are off slightly from our previous report on some of the grades. Some demand from the tire manufacturers in the Akron district is reported, but this is not sufficient to effect prices materially.

Quotations of this date (per pound in carload lots delivered, except Mixed Auto which is quoted per ton) are as follows:

Auto tire peelings	.00¾	@	—
Standard White auto	.00⅞	@	—
Mixed auto	ton 9.00	@	10.00
Bicycle tires	.00¼	@	.00⅜
Clean solid truck tires	.00⅝	@	.00¾
Boots and shoes	.02¼	@	.02⅜
Arctics, trimmed	.01½	@	.01⅝
Arctics, untrimmed	.01	@	.01¼
Inner tubes, No. 1	.02⅝	@	.02¾
Inner tubes, compounded	.01⅞	@	.01¾
Inner tubes, red	.02¼	@	.02⅜
Battery jars, clean hard rubber	.00⅞	@	.01
Heels and pads	Nominal		
Black mixed	.00½	@	—
Garden Hose	.00⅜	@	—
Air brake hose	.00⅜	@	.00½
Red packing	.00⅞	@	.00⅞
White mixed rubber	.01	@	.01¼

American Rubber Patents

1,421,690. Edward G. Howard, Cincinnati, Ohio. Rubber garter.

1,421,818. Clifford H. Oakley, Trenton, N. J. Rubber mat.

1,421,795. Otto H. Macklin, Akron, Ohio, assignor to The Miller Rubber Co., Akron, Ohio. Apparatus for producing thin rubber sheets.

1,421,755. Ulrich Anderson, Wausau, Wis. Cushion tire and rim therefor.

1,421,418. Haro'd A. Denmire, Akron, Ohio, assignor of one-half to the General Tire and Rubber Co., Akron, Ohio, Collapsible tire core.

1,421,537. Moses W. Needham, Waco, Texas. Soft-rubber tire filler.

1,421,917. Robert Curry, New York City, New York. Resilient tire.

1,421,046. William G. Fording, Cleveland, Ohio, assignor to the Fisk Rubber Co., Chicopee Falls, Mass. a corporation of Mass. Method of forming tires.

1,421,616. Albert Peter Thurston, London, England. Strip or sheet metal structure.

1,422,084 Warren F. Clark, Cleveland, Ohio, assignor, by mesne assignments, to Automatic Electric Heater Co., Warren, Pa., a Corporation of Delaware. Mold Adapted for Use in Vulcanizing Rubber Articles.

1,422,147 Edward C. Taylor, Springfield, Mass., assignor to The Fisk Rubber Co., Chicopee Falls, Mass. Method of Treating Rubber Articles.

1,422,115 Rhetherford B. Martin, New York, N. Y. Composition for Treating Manufactured Rubber.

1,422,561 John William Gomersall, Manchester, England. Rubber-Forcing Machine.

1,422,642 Elizabeth Mary Walters, Hove, England. Rubber Globe.

1,422,446 Louis Kaplan, New York, N. Y. Rubber Heel.

1,422,209 Peter J. Knaus, Milwaukee, Wis., assignor by mesne assignments, to The Fisk Rubber Co., Chicopee Falls, Mass. Apparatus for Vulcanizing Articles of Rubber or Rubberized Fabric.

1,422,579 William J. Kent, Brooklyn, N. Y., assignor to Peerless Rubber Manufacturing Co., a Corporation of New York. Method of Making Rubber Tilling.

1,422,723 Frederick J. Leisse, St. Louis, Mo. Automobile Tire.

1,422,083 Thomas A. Burns, Toronto, Ontario, Canada, assignor to Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ontario, Canada. Apparatus for Solutioning Tire Beads.

1,422,290 Daniel Moriarty, Oakland, Calif. Tire Casing.

1,422,451 Frederick A. Krusemark, Roanoke, Va., assignor to K. F. & C. Tire & Rubber Corp., Roanoke, Va. Method of Making Rubberized Tire Fabric.

Trade Marks Applied For

[The following are trade-mark applications pertinent to our field pending in the United States Patent Office which have been passed for publication and are in line for early registration unless opposition is filed promptly. For further information address National Trade-Marks Company, Barrister Building, Washington, D. C. or Bush Building, 130 West 42 Street, New York, trade-mark specialists. As an additional service feature to its readers this Journal gladly offers to them an advance search free of charge on any mark they may contemplate adopting or registering.]

AMBASSADOR—No. 164,290. Ambassador Tire Corporation, N. Y. C. For pneumatic rubber vehicle tires.

DURO—No. 164,445. Johns Manville Incorporated, N. Y. C. For piston and pistonrod packing made of textile fabric and rubber cement.

RACINE TRUSTY—No. 158,951. Racine Rubber Company, Racine, Wis. For rubber or rubber and fabric tires for vehicles.

BROWNDEL—No. 160,891. The Manhattan Rubber Mfg. Co., Passaic, N. J. For brake lining made partly of asbestos and partly of rubber.

GIMICK, arranged to form a cross. No. 158,777. Tire Inflator Co., Philadelphia, Pa. For tire-inflating devices consisting of valve receptacles containing fluid under pressure for inflating pneumatic tires.

GOVERNFORM—No. 155,682. The Governform Corporation, N. Y. C. For belts, belting, and elastic, all these goods being fastening, retaining, adjusting, and supporting devices prepared for use in the construction of wearing apparel, garters, and neckties.

ASTER—No. 159,732. Schloss Manufacturing Co., San Francisco, Calif. For fruit jar rings.

PEONY—No. 159,731. Schloss Manufacturing Co., San Francisco, Calif. For fruit jar rings.

DAISY—No. 159,730. Schloss Manufacturing Co., San Francisco, Calif. For fruit jar rings.

DIAMOND—No. 159,729. Schloss Manufacturing Co., San Francisco, Calif. For fruit jar rings.

PICTURE comprising of a rectangular field diagonally divided into triangular fields colored red and white; respectively. No. 159,728. For fruit jars. Schloss Manufacturing Co., San Francisco, Calif.

EMERALD—No. 159,727. Schloss Manufacturing Co., San Francisco, Calif. For fruit jar rings.

GOODRICH, within panel across figures 55. No. 166,167. The B. F. Goodrich Company, New York City. For pneumatic tire castings made of rubber combined with fabric.

F in red disc between two arrow heads. No. 161,043. The Fisk Rubber Company, Chicopee Falls, Mass. For rubber vehicle tires.

VELVET—No. 160,157. W. H. Salisbury & Company, Incorporated, Chicago, Ill. For rubber tiling for floors.

PICTURE of a lion with numerous small rings about feet. No. 146,087. Societe Anonyme Des Produits du Lion Noir, Montrouge near Paris, France. For bleaching compounds, powders and fluids, chemical products for removing rust stains, dyestuffs, lye, and chemical preparations for cleaning, and sterilizing fabrics containing rubber.

LION NOIR—No. 146,089. Societe Anonyme des Produits du Lion Noir, Montrouge, near Paris, France. For bleaching compounds, powders, and fluids; dyestuffs, lye, chemical preparations for cleaning and sterilizing fabrics containing rubber.

New Incorporations

CALIFORNIA

California Tire & Rubber Co., Torrance, Los Angeles County, Calif. Incorporated Capital $500,000.

National Rubber Company of California, to manufacture all kinds of rubber goods. $100,000. Principal office, Los Angeles.

Sylvester Rubber Corporation to manufacture and deal in rubber heels. $50,000. Incorporators: Stacy D. Webb, Bell Franklin and Moses P. Martignoli.

DELAWARE

The Globe Rubber Products Co., to manufacture rubber products. $50,000. Homer J. Smith, agent, Wyoming, Delaware. Incorporators: H. Lindale Smith, L. Merchant and J. M. Whitford—Cleveland, Ohio.

United and Globe Rubber Products Co., dealers in rubber and gutta percha. $2,500,000. Incorporators: W. McK. Milner, Trenton, N. J.; Joseph Green and Harry Miller, Bethlehem, Pennsylvania. Representative, Sylvester D. Townsend, Jr., Wilmington, Delaware.

Indemand Products Corporation to manufacture rubber goods. $100,000. Principal office, Wilmington, Delaware. Agent, Colonial Charter Co., Wilmington, Delaware.

ILLINOIS

Carl Fischer Tire & Rubber Co., to manufacture automobile tires and tubes. $3,000. Incorporators: C. R. Fischer, F. A. Winship and J. C. De Wolfe. Principal office, 1414 South Michigan Boulevard, Chicago, Illinois.

Stratford Rubber Manufacturing Co., to deal in tires and rubber products. $1,000. Incorporators: S. H. Silverman, C. S. Peterson, and C. D. Unger. Principal office, 1736 South Michigan avenue, Chicago, Illinois.

INDIANA

State Tire and Rubber Co., to deal in tires. $75,000. P. Deutscher, president; S. Zukerman, vice president; J. Deutscher, treasurer. Principal office, 204 South Illinois street, Indianapolis, Indiana.

MAINE

Hamosax Manufacturing Co., to deal in rubber goods. $200,000. H. T. Hawthorne, president, Montclair, New Jersey; D. A. Hatch, treasurer, Bath, Maine. Principal office, Bath, Maine.

MARYLAND

The Falls Tire Co., to deal in tires. $50,000. Incorporators: W. F. K. Jones, F. Kahler, F. Wood, Baltimore, Maryland. Principal office, 2021 North Charles street, Baltimore, Maryland.

MASSACHUSETTS

Textile Rubber Co., to manufacture rubber goods. $50,000. J. E. Shannon, president, East Boston, Massachusetts; C. V. McManus, treasurer and C. Strongman, secretary—Lynn, Massachusetts.

NEW JERSEY

Duratex Corporation, to manufacture leather, rubber and textile goods. $1,000,000. Incorporators: Arthur W. Britton, Samuel H. Howard and Robert K. Thistle—New York City.

Monmouth Vulcanizing Works, to deal in tires and automobile accessories. $50,000. Incorporators: J. Pilling, 211 Fouth avenue and R. Anderson, 771 Brinley avenue—Bradley Beach, New Jersey; B. Klein, 743 Mc Donough St., Brooklyn, New York. Principal office, Fifth avenue and Main street, Bradley Beach, New Jersey.

B. C. Tillinghast Rubber Manufacturing Co., to manufacture rubber products. $50,000 preferred stock and 1000 shares common stock. Incorporators: H. A. Black and C. J. Skinner—15 Exchange Place, Jersey City; W. Edelman, 609 W. 115th street, New York. Principal office, 15 Exchange Place, Jersey City.

NEW YORK

The Diamond Rubber Co., Inc. $200,000. Principal office, 500 South Main St., Akron, Ohio. Wisconsin agent, Benton Thompson, 553 Jefferson St., Milwaukee.

Sumatra Rubber Specialties Co., to manufacture rubber goods. $5,000. Incorporators: C. Smith, J. R. Smith and H. D. Smith—257 Water street, New York City.

OHIO

Oak Hill Rubber Co., to deal in rubber goods. $175,000. Incorporators: R. E. Burkholder, G. W. Alden, J. F. Smith, O. M. Roderick and Beulah Hartman. Principal office, Oak Hill, Ohio.

Midwest Rubber Co. $25,000. Incorporators: G. A. Field and L. V. Kimbel, W. C. Swancott, Olive Field and T. S. Stewart. Principal office, Cleveland, Ohio.

States Rubber Holding Co. $100,000. Incorporators: F. H. Kelsey and Sam Degraw. Principal office, Cleveland, Ohio.

Emergency Road Service, to deal in tires and tubes. 1000 shares no par value. Incorporators: W. Eberly, C. A. Hope, J. J. Sloan, H. R. Palmer and C. F. Batey. Principal office, Cleveland, Ohio.

Hooker Tire & Supply Co., to deal in tires and tubes. $15,000. Incorporators: W. C. Taylor, J. B. O'Donnell, J. D. Ellis, R. C. Cronin, M. A. Wood. Principal office, 414 Walnut street, Cincinnati, Ohio.

Lincoln Accessory Co., to deal in tires and tubes. $10,000. Incorporators: W. L. Henne, J. M. Herndon, R. Black and T. Jenhon. Principal office, Walnut and 8th streets, Cincinnati, Ohio.

National Corporation Manufacturing Co., to manufacture hard rubber products. $50,000. Incorporators: C. F. Schriner, E. R. Kelly, C. C. Scheible and W. M. Kinsley. Principal office, 3860 East 91st street, Cleveland, Ohio.

Ryan and Gilfillan Co., to deal in tires and tubes. $50,000. Incorporators: I. A. Ryan, D. M. Gilfillan and E. Jeffers. Principal office, Ironton, Ohio.

Yarger Vulcanizing Co., to deal in tires and tubes. 500 shares, no par value. Incorporators: F. J. Yarger, E. F. Yarger, E. F. Baskey, M. E. Baskey and E. E. Babione. Principal office, Freemont, Ohio.

OREGON

The General Tire Co., to buy and sell tires. $25,000. M. J. Woolach, president; W. L. Powell, vice president and treasurer; C. H. Green, secretary. Principal office, 446 Stark street, Portland, Oregon.

PENNSYLVANIA

Standard Tire Co., to deal in tires. $20,000. Incorporators: L. W. Bossard, P. B. Welsh and E. F. Grimm—Piitsburg, Pennsylvania; J. L. Stahlnecker—Dorment, Pennsylvania; D. C. Uhrich—McKeesport, Pennsylvania. Principal office, Pittsburg, Pennsylvania.

Capital Increase

Burbock Non-Skid Tire Corp., New York, $250,000 to $500,000.

Dissolution

Long-Wear Tire & Rubber Co., Manhattan, New York.

THE RUBBER AGE BUYERS GUIDE

ACCELERATORS
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, O.
National Aniline & Chemical Co., Inc., New York.
Rubber Service Laboratories Co., The, Akron, O.
States Metals Co., Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago.

ACCUMULATORS
Adamson Machine Co Akron, O.
Akron Rubber Mold & Machine Co., Akron, O.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Wellman - Seaver - Morgan Co., Cleveland, Ohio.

ACIDS
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, O.
National Aniline & Chemical Co., Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago.

ACID TANKS
Birmingham Iron Foundry, Derby, Conn.
Devine, J. P., Co., Buffalo, N. Y.
Farrel Foundry & Machine Co., Ansonia, Conn.

AIR & STEAM METAL BAGS
Allsteel Ridewell Tire & Rubber Co., Dayton, Ohio.

AIR BRAKE HOSE
United States Rubber Co., New York.

AIR GOODS
Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., Tuckahoe, N. Y.
United States Rubber Co., New York.

AIR MATTRESSES
Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., Tuckahoe, N. Y.
United States Rubber Co., New York.

AIRPLANE AND BALLOON CLOTHS
United States Rubber Co., New York.
Hodgman Rubber Co., Tuckahoe, N. Y.

ALBA WHITING
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, O.
Industrial Chemical Co., New York.
Wishnick-Tumpeer Chemical Co., Chicago.

ALCOHOL
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, O.
Tyler Patterson Co., Clev'd, O.
Wishnick-Tumpeer Chemical Co., Chicago.

ALUMINUM FILLER
Daigger, A., & Co., Chicago, Ill.
Wishnick-Tumpeer Chemical Co., Chicago.

ALUMINUM FLAKE
Aluminum Flake Co., Akron, Ohio.
Butcher, L. H., Co., New York.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, O.
Rubber Service Laboratories Co., The, Akron, O.

AMMONIA AQUA
Daigger, A., & Co., Chicago, Ill.
Laidlow, Kelly & Co., New York.
Tyler Patterson Co., Clev'd, O.
Wishnick-Tumpeer Chemical Co., Chicago.

ANGLE THERMOMETERS
Taylor Instrument Companies, Rochester, N. Y.

ANILINE OIL
Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Klipstein, A., & Co., New York.
National Aniline & Chemical Co., Inc., New York.
Tyler Patterson Co., Clev'd, O.
Wishnick-Tumpeer Chemical Co., Chicago.

ANILINE OIL PLANTS
Devine, J. P., Co., Buffalo, N. Y.

ANTIMONY, SULPHURETS
Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, O.
States Metals Co., Inc., New York.
Rare Metal Products Co., Belleville, N. J.
Tyler Patterson Co., Clev'd, O.
Typke & King, Mitcham, England.
Wishnick-Tumpeer Chemical Co., Chicago.

APRONS—RUBBER
Hodgman Rubber Co., Tuckahoe, N. Y.
Miller Rubber Co., Akron, Ohio.

ARTIFICIAL RUBBER
Carter Bell Mfg. Co., New York.
Stamford Rubber Supply Co., Stamford, Conn.

ASBESTINE
Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, O.
Tyler Patterson Co., Clev'd, O.
Wishnick-Tumpeer Chemical Co., Chicago.

ATOMIZERS
The Rubber Products Co., Barberton, Ohio.

AUTOCLAVES
Devine, J. P., Co., Buffalo, N. Y.

AUTOMOBILE COATS
Hodgman Rubber Co., Tuckahoe, N. Y.
United States Rubber Co., New York.

AUTO TOP FABRICS
Hodgman Rubber Co., Tuckahoe, N. Y.
Taylor, Armitage & Eagles, Inc., New York.
Turner Co., J. Spencer, New York.
United States Rubber Co., New York.

BALATA
Wood, Charles E., New York.

BALATA FILM (Colorless)
Peters Bros. Rubber Co., N. Y.

BALLOON FABRICS
United States Rubber Co., New York.

H&G

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ANTIMONY SULPHURET

THE HARSHAW FULLER AND GOODWIN CO.

Cleveland
Chicago Philadelphia New York

H&G H&G

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A New Antimony

We invite your attention to a recent addition to our standard grades of Antimony Sulphuret.

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Pure Antimony Pentasulphide containing 15-17% free sulphur.

Seven reasons why you should use this product.

1. It is free from Calcium Sulphate.
2. It will give a smoother texture.
3. It has the greatest covering power.
4. It will stand higher temperatures.
5. It will give a beautiful orange red color - the one most popular with the consumer.
6. It will give a non blooming stock. - hence the minimum amount of uncombined free sulphur - therefore better aging.
7. It is inexpensive.

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